

The Iron Age

INDEX TO
READING MATTER
PAGE 34

A Review of the Hardware, Iron and Metal Trades.

INDEX TO
ADVERTISEMENTS
PAGE 31.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXVI: No. 16.

New York, Thursday, April 17, 1884.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

Cost of Repairs to Naval Vessels.

The forthcoming report of the Naval Board of Inspection and Survey will include some significant facts relative to the results of their inspection of vessels at the Brooklyn Navy Yard, and will give more in detail the deplorable condition of some of the vessels still borne on the navy register. They will also confirm the statements made by the Chief of the Bureau of Construction and Repairs. For instance, the old frigate Colorado, which has been in commission as a receiving ship at the Brooklyn Navy Yard for several years, is to be succeeded by the old frigate Vermont. All materials that can be made use of from the Colorado are to be utilized in fitting out the Vermont. Upon the completion of this work the Colorado is to be stripped of all materials that can hereafter be used in the repairs of other vessels, and then she will be placed in "ordinary," to be appraised and sold. This course has been decided upon because it was estimated that the cost for repairs of the Colorado would be \$120,000 to make her seaworthy. The Colorado was built in 1855 at an original cost for hull and machinery of \$883,960. The repairs upon her since have been \$529,295 by the Bureau of Construction and Repairs, \$335,967 by the Bureau of Steam Engineering, and \$522,873 by the Bureau of Equipment, making a total of \$2,722,095.

The frigate New York, which was designed and put in frame by Naval Constructor B. F. Delano in 1865, and has had \$581,475 expended upon her, is still on the stocks, and it is estimated, will require \$400,000 more to complete her. She is of fine model, and has a live-oak frame that, from its age and the care taken of it, is in an excellent state of preservation. She is 315 feet in length on the mean load line, 345 feet over all, 47 feet breadth of beam and 25 feet 11 inches depth from the lower edge of the keel to the lowest port sill of gun deck. She was designed to be ship-rigged. Her armament could be made equal to the weight of two 100-pounders, one 60-pounder Parrott rifle and 16 9-inch smooth-bore guns. A battery could also be arranged to have a direct bow and stern fire from half-turret guns on the spar deck and recessed ports on the gun deck. With modern engines and boilers the vessel could be given a 14-knot speed. Materials for steel boilers were purchased last year, and work on them is well under way in the steam engineering department at the Washington Navy Yard. The displacement of this vessel at a draft of 18½ feet forward and 21 feet 5 inches aft is 4527 tons. When the question of completing her is decided the plans can be finished in a short time; and if the materials for planking, ceiling, decks and other woodwork, excepting joiner materials, are impregnated by the Thilmany process for preserving ship timber, the Chief Naval Constructor is of the opinion that she will be useful for the next 20 years.

The Java, another frigate, lies on the stocks alongside the New York, but was built of white oak which is so thoroughly rotten that she is not worth completing. The Colossus, which was begun during the war and lies partially completed in the ship-house, was intended as a double-turreted monitor. As the woodwork is badly rotted with tigneous acid from contact with the iron frames, it will probably be sold for cordwood. She has iron diagonal truss frames which cost \$157,000. These frames are all keyed together, and it is recommended that they can be readily and economically removed from the vessel, shipped to the Washington Navy Yard and worked over into such sizes of materials as may be required for use in new vessels or the repairing of old ones in the future.

The Intrepid, an iron armored vessel of 1150 tons displacement, was built in the Boston Navy Yard in 1872 at a cost of \$582,721. Since then \$16,632 has been expended upon her for repairs. The plans for alterations of this vessel were recently approved by a naval board, and preparations are now making to haul out the vessel for the necessary alterations. When completed it will give to the navy an effective gunboat for use in the Asiatic squadron. The frigate Tennessee, which is the largest vessel in the navy, and has cost more than any other, is doomed. The Chief Naval Constructor reports that the probable life of this vessel will not extend beyond 12 months, when she will be past repairing under the present law, which forbids the repair of any wooden vessel of the navy estimated to cost more than 20 per cent. of the appraised value of a new ship of like size and materials. As she originally cost \$1,856,075.81 (\$908,564 for the hull and \$948,075.81 for her machinery and outfit), the cost for repairs would be \$371,215. In addition to her original cost, the expenditures for repairs since she was finished in 1867 have been \$331,574.34 by the Bureau of Construction, \$586,009.60 by the Bureau of Steam Engineering, and \$323,128.34 by the Bureau of Equipment, making a total of \$3,596,786.14.

The New Town of Hegewisch.—Another of these new model industrial enterprises for which Chicago is so famous is developing upon the forks of the Calumet River, and between it and the Chicago and Atlantic, and Louisville, New Albany and Chicago, and the New York, Chicago and St. Louis, and the Chicago and West Indiana

railroads. The United States Rolling Stock Company, of which Mr. Adolph Hegewisch is president, have here purchased 200 acres, while other companies have united in setting apart some 1300 acres of land to be made into the model manufacturing town of Hegewisch. The foundation for the larger shops was laid last fall and others are now under way. Eventually shops and machinery to build rolling stock will be erected, employing a population of 10,000 people.

Improved Cut Nail Machine.

The annexed engraving illustrates an improved cut nail machine, manufactured by the American Nail Machine Company, of Ashtabula, Ohio. It represents the smallest of five sizes, which constitute the series they are building, the machine presenting several features of interest to cut-nail manufacturers, as it is well known that the nail

shrunk in and parallel with the axis of the power shaft and cutting lever, thus avoiding waste of power and the tendency to heat. All the conic centers are located in the bed-plate, the heading lever being inclosed within the latter and actuated in such a way that its power multiplies as it approaches, and, while upsetting the head of the nail, producing heads of any size without endangering the machine. The toggle is applied behind the heading die, applying the power direct to the work, and there is no springing, thus obviating the necessity of pounding the gripping dies in order to head the nail. The gripping lever is yoked to its operative cam, requiring no retracting spring to act as a brake and waste the power given out by the engine. The motion of this lever, moreover, admits of adjustment. The gripping cams are ground, and their form is such that the dies are in contact during the exact period required for gripping and heading the nail. The time of the nipper may

different parts of the country and, according to all accounts, are doing good work, giving general satisfaction.

The capacities and speeds of these improved machines are as follows:

No.	Size	Speed, E. pr. M.
No. 1.	3¼ in. to 3 in. or ¾ in. to 6d.	250 to 300
No. 2.	2 in. to 3¼ in. or 6d. to 12d.	200 to 250
No. 3.	3 in. to 4½ in. or 10d. to 30d.	150 to 200
No. 4.	4 in. to 5½ in. or 30d. to 50d.	100 to 150
No. 5.	Up to 7-in. spikes	75 to 100

British Swords and Bayonets.

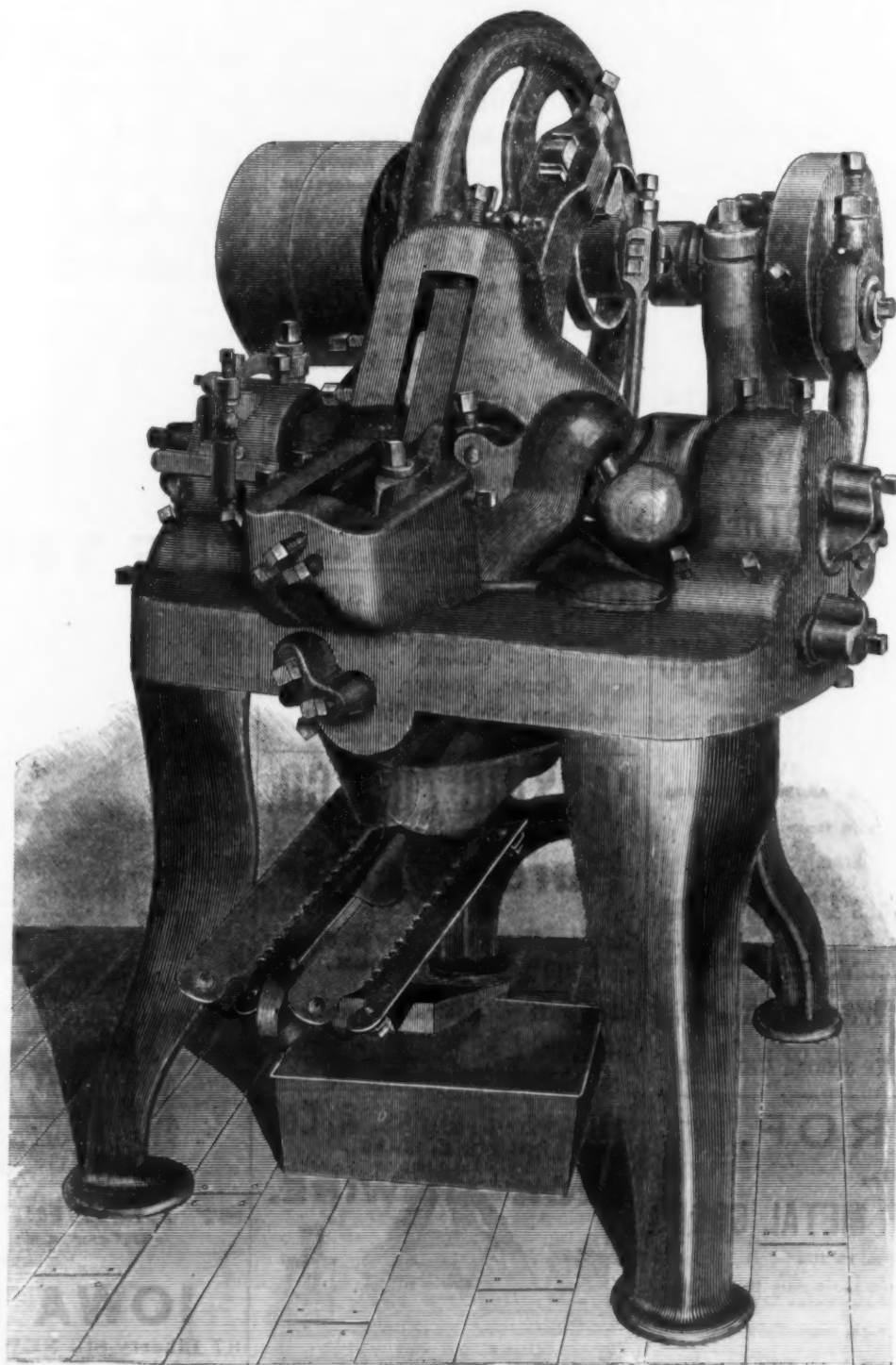
A considerable amount of interest was recently excited by a statement telegraphed from London relative to the behavior of the swords and bayonets used by the British troops in the engagement with Osman Digna. The correspondent who forwarded the account of the fight stated the swords and bayonets used to have been so poor in quality

less compiled and transmitted in all the hurry and excitement of a fiercely-contested battle. We do not for a moment seek to dispute the *bona fides* of the correspondent who sent home the news; yet, with our fuller knowledge of the technical aspects of the issues raised, we are not disposed to accord full credit to the statement that a sharp-pointed bayonet would not penetrate a human body by a direct thrust. The worst of steel would do this, and, with the meager evidence in our possession, we cannot jump at the conclusion that the bayonets supplied to our soldiers have been made of material so worthless as to bend when in contact with human bones. As regards the swords, the alleged bending may be more readily explained, but, with our knowledge of the respectable firms who have supplied the War Office and Admiralty with swords and cutlasses, we should certainly decline to believe all that is insinuated without official corroboration.

"There is much in the newspaper report, indeed, which we find ourselves unable to properly assimilate. Setting aside for the moment the swords and bayonets of our own troops, we are told that the lances of the Arabs did their work well, and penetrated the bodies of our men with fatal efficiency. If this be true, therefore, these lance-heads, used by men who are little better than savages, and supplied to them, no doubt, in the customary "African trade" manner, were of better quality than the weapons supplied, under British Government tests, by the most skillful manufacturers in the world, to troops which are certainly second to none. Here, also, are difficulties of digestion which we are quite unable to remove, nor are we able to comprehend why no complaints were made of the weapons used by our men at El Teb, or in all the other fighting of recent years. Surely the swords and weapons have not been so greatly affected by the climate of the Soudan as to give way suddenly, and in a most provoking manner, just at a most critical moment! At Sheffield it is publicly hinted that the competition of the steel manufacturers may not improbably be found to have caused a deterioration in the quality of the lethal weapons under reference. It is alleged that sword and bayonet steels are offered at prices at which good crucible cast steel cannot possibly be sold, and that Bessemer steel alone can be supplied at the quotations. Further, it is held that competition among the sword and bayonet makers themselves is so keen that they cannot afford the time and care in manufacture which are necessary to turn out goods of proper temper. These, however, are very general allegations, although they are serious reflections upon a number of manufacturers whose reputations have been hitherto above suspicion. They are also grave reflections upon the Government authorities charged with the inspection of military weapons; consequently, it is most desirable on every ground that the whole affair should be thoroughly and resolutely sifted at the very earliest moment."

The plans proposed for the construction of the Philadelphia extension of the Baltimore and Ohio Railroad have given considerable prominence to the oft-discussed question of grade crossings, and have aroused much interest in Philadelphia, as well as Baltimore. The method favored in the latter city is the construction of an elevated railroad, but, notwithstanding the elimination of dangerous features which it would effect, considerable opposition has been encountered, the antagonists of the scheme contending that, inasmuch as it is intended to be extensively used for the transportation of freight as well as of passengers, laws sanctioning it cannot be justified on the grounds which led to the authorization of the elevated roads of New York, these being devoted exclusively to the carriage of passengers, and furnishing accommodations for local travel of incalculable value. In Philadelphia, on the other hand, the necessity of avoiding grade crossings does not seem to meet with due appreciation, and in the work of extension to be carried on there this important point is apparently ignored. It is pleasing to note, however, that the grant of a right to erect over the Schuylkill River a bridge to be used by the extension of the road is to be withheld until plans of the route to be followed after such a crossing is effected have been presented to and been approved by the Councils of Philadelphia. The large number of grade crossings now existing there, and the many serious and fatal accidents they occasion, have made conservative action necessary, and as those interested in the question are not only the railroads directly concerned, but the entire number of travelers exposed to the dangers of such traps, the establishment of further crossings of the same nature should be prevented, if at all possible.

At the close of September, 1883, as appears from a French official railway return, there were 16,804½ miles of line in operation in France. The corresponding length of line in operation at the close of September, 1882, was 16,174½ miles, so that in the 12 months ending September, 30, last year, 720 miles of new line were brought into operation. The aggregate revenue acquired on all the French lines in the 12 months ending September 30, 1883, was \$162,627,550, as compared with \$161,364,150 in the 12 months ending September 30, 1882.



IMPROVED CUT NAIL MACHINE.—AMERICAN NAIL MACHINE COMPANY, ASHTABULA, OHIO.

machines in common use in North America and Europe have not been changed, modified or improved in any way for a considerable length of time. Their arrangement, proportion and construction are such that they do not fully meet the modern requirements, and especially since the advent of the age of steel have their deficiency become more apparent. It was with a view to supply the more exacting requirements of the present time that this machine has been brought out.

It is claimed for the machine that it combines all the convenient arrangement of parts, strength, symmetry of design, correct proportions, durability and simplicity requisite in this class of machinery. The parts are all interchangeable, and their proportion is such that the danger of breakage is greatly reduced. The working parts are well finished and properly proportioned, and the journal-bearings, center bushings and friction plates are made of best carbon bronze. The journal and bushing bronzes are accurately scraped and turned to a driving fit, aligned and bored in position. The crank and wrist pins are of best tool steel

be adjusted without adding to, taking from or in any way mutilating its cam. All the holding and adjusting set-screws are of best tool steel, carefully tempered, and are so located with reference to the line of thrust as to produce the best result. The bed-die and knife-holders are in all cases inclined two ways at angles of 3°. The moving knives are all straight, thus locating the cutting stress within, instead of outside, the face. The stationary head or tool-holder in the bed-plate is so constructed as to possess all the requisite strength for this part. The balance or fly-wheel is located between the housings, thus securing and maintaining a proper alignment of the power-shaft. The machines are furnished with tools, &c., ready for operation, and the present routine of operation or making nails is not changed in any way. Any of the parts can be instantly replaced, thereby effecting to the nail manufacturer a great saving on repairs and of time.

Any mechanical self-feeder can be attached without mutilating, altering or encumbering the working parts of the tool. The machines are now extensively used in

that if they touched a bone they bent like hoop iron without piercing the body, whereas the lances of the Arabs appeared to do all that was required of them. Referring to this, the London *Ironmonger* of recent date publishes an article which, while in a measure questioning the entire trustworthiness of the reports, directs attention to some rumors seriously reflecting upon several British steel manufacturers. We quote as follows:

"The prominence accorded to the report has insured due notice, and there can be no doubt that the matter will not be allowed to rest. The Government have been questioned on the subject in the House of Commons, and General Graham has been instructed to send home a report, together with any defective weapons of the sorts indicated, so that the War Office should be enabled to open up a thorough investigation at an early date. Pending the result of the official inquiry, it would perhaps be a little premature to express anything like a decided opinion. At the same time we may venture the surmise that the swords and bayonets are not by any means so bad as they have been represented to be by a report which was doubt-

ANSONIA BRASS AND COPPER CO.,
MANUFACTURERS OF
PURE COPPER WIRE,
For Electrical Purposes,
Bare and Covered.
O'NEIL'S PATENT NICKEL-
PLATED COPPER.
Seamless Brass &
Copper Tubing,
Sheets, Bolts,
Rods, Wire,
&c.,
— IN —
W. E. DODGE
Pres't.
J. P. COWLES,
V.-P. and Treas.
A. A. COWLES,
Secretary.
Ansonia Refined Ingot
Copper, Anchor Brand;
LAKE INGOT COPPER.
19 & 21 Cliff Street,
NEW YORK.

PHELPS, DODGE & CO.,
IMPORTERS OF
TIN PLATE,
ROOFING PLATE,
Sheet Iron Copper, Pig Tin, Wire,
Zinc, &c.
MANUFACTURERS OF
COPPER AND BRASS.
CLIFF STREET, NEW YORK.

SCOVILL MFG CO
BRASS,
HINGES WIRE, GERMAN SILVER.
PHOTOGRAPHIC GOODS.
BUTTONS,
CLOTH AND METAL.
DEPOTS FACTORIES,
419 & 421 Broome St., N. Y. Waterbury, Conn.
177 Devonshire St., Boston. New Haven, Conn.
183 Lake St., Chicago. New York City.

DICKERSON, VAN DUSEN & CO.,
Importers of
Tin Plate, Pig Tin, Sheet Iron, Copper,
Wire, Zinc, Etc.
29 & 31 Cliff St., cor. Fulton,
DICKERSON & CO., Liverpool. NEW YORK.

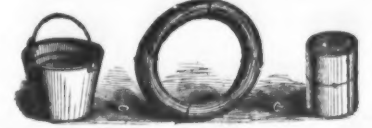
**THE NEW HAVEN
COPPER CO.,**
SOLE MAKERS OF
POLISHED COPPER
Under Patent of T. James, Sept. 12, 1876.
ALSO MANUFACTURERS AND
DEALERS IN
BRAZERS & SHEATHING COPPER,
Kettles, Bottoms, Bolts, Circles, &c.
290 Pearl Street - NEW YORK.

A. C. NORTHROP,
Waterbury, Conn.,
NOVELTIES IN BRASS AND OTHER METAL GOODS
FOR HARDWARE TRADE.

Wrought Iron and Brass Machine Screws; Turned, Hexagon, Round and Square Head Cap and
Set Screws; Brass and Iron Safety and Jack Chain; Gilt, Nickel Plated and Bronze Trimmings of all
kinds, from sheet Iron, Steel or Brass.
Estimates on patented articles, or any description of Sheet Metal work, respectfully solicited and
promptly given.

BRODERICK & BASCOM ROPE CO.,
MANUFACTURERS OF
WIRE ROPE
BRODERICK & BASCOM ROPE CO.
IRON WIRE ROPE, STEEL WIRE ROPE.
728 N. Main St., St. Louis, Mo.

WORCESTER WIRE CO.,
Manufacturers of
**IRON AND STEEL
WIRE**
For all Purposes.
WORCESTER, MASS.


Waterbury Brass Co.
CAPITAL, \$400,000.
Sheet, Roll and Platers' Brass,
GERMAN SILVER,
Copper, Brass and German Silver Wire
BRASS AND COPPER TUBING,
COPPER RIVETS AND BURS,
BRASS KETTLES,
Door Rail, Brass Tags,
PERCUSSION CAPS,
POWDER FLASKS,
Metallic Eyelets, Shot Pouches Tape Measures, &c.
And small Brass Wares of every Description.
Cartridge Metal in Sheets or Shells a Specialty.
Sole Agents for the
Capewell Mfg. Co.'s Line of Sport-
ing Goods.
DEPOTS, 296 Broadway, New York, WATERBURY, Conn.
125 Eddy St., Providence, R. I.

POPE, COLE & Co.
**BALTIMORE
COPPER WORKS,**
No. 57 South Gay St., BALTIMORE, MD.
Have always on hand and for sale
INGOT COPPER,
Also Cakes, of unequalled purity and toughness.

ROME IRON WORKS,
Manufacturers of
Brass, Gilding Metal, Cop-
per and German Silver
(In Sheets, Rods, Tubing or Wire),
**COPPER & BRASS RIVETS
AND BURS.**
Rome, New York.

BROWN & BROTHERS,
81 Chambers St., N. Y. Waterbury, Conn.

**BRASS, COPPER AND
GERMAN SILVER**
In Sheets, Rods, Wire, Tubing,
Rivets, and Burs, Etc.
ALSO,
Seamless Brass & Copper Tubing.
PATENTED SEAMLESS BRASS AND COPPER
HOUSE BOILERS, warranted to stand 100 lbs.
pressure and guaranteed against vacuum.
PATENTED SPRING TEMPERED SHANK,
SILVER-PLATED, FLAT TABLE WARE, in rich
designs.
GERMAN SILVER SPOONS AND FORKS.

**The Plume & Atwood
Mfg. Company,**
MANUFACTURERS OF
SHEET and ROLL BRASS and WIRE,
German Silver and Gilding Metal.
Copper Rivets and Burs,
Copper Electrical Wire, Pins,
Brass Butt Hinges,
Jack Chain,
Kerosene Burners,
Lamp Trimmings, &c.
18 Murray Street, New York.
13 Federal Street, Boston.
109 Lake Street, Chicago.
Rolling Mill, THOMASTON, Ct. | Factories, WATERBURY, Ct.

Bridgeport Brass Co.,
MANUFACTURERS OF
Sheet and Roll Brass,
Brass & Copper Wire & Tubing,
Seamless and Brazed Tubing,
Copper and Iron Rivets.
OILERS and CUSPADORES, LAMPS and TRIMMINGS,
LANTERNS and TRIMMINGS, KEROSENE BURNERS,
Clocks & Fly Fan Movements, PLUMBERS' MATERIALS.
Particular attention paid to cutting out Blanks
and manufacturing Metal Goods.
MANUFACTORY, BRIDGEPORT, CONN. | WAREHOUSE,
19 Murray St., N. Y.

Holmes, Booth & Haydens,
WATERBURY, CONN.
NEW YORK, BOSTON.
49 Chambers St. 18 Federal St.
Manufacturers of all kinds of
Brass, Copper & German Silver,
ROLLED AND IN SHEETS.
BRASS & COPPER WIRE,
Tubing, Copper Rivets & Burs.
**BRASS & IRON
JACK CHAIN, DOOR RAIL,**
German Silver Spoons,
SILVER PLATED FORKS & SPOONS,
Kerosene Burners, &c.

JOHN DAVOL & SONS,
Agents for
Brooklyn Brass & Copper Co.,
Dealers in
Ingot Copper, Spelter, Lead, Tin,
Antimony, Solder & Old Metals.
100 John Street, New York.

PASSAIC ZINC CO.
Manufacturers of
Pure Spelter
FOR
Cartridge Brass, Gas Fixtures, Bronzes
AND ALL FINE WORK.
Also for
Galvanizers & Brass Founders.
MANNING & SQUIER, Gen'l Agents,
113 Liberty Street, N. Y.

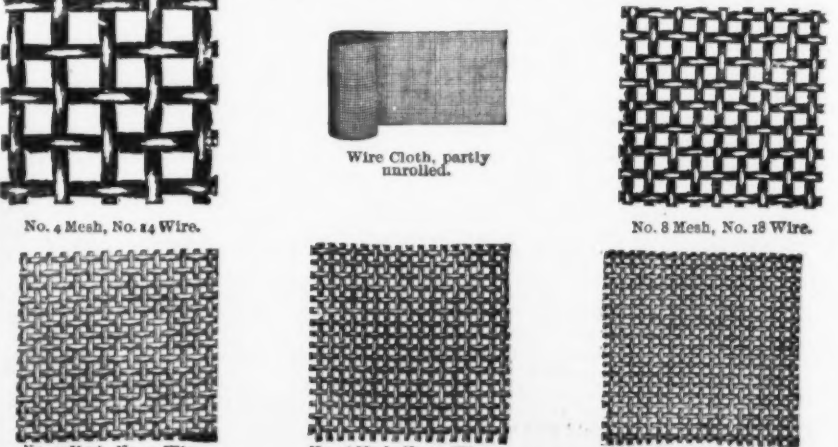
Geo. W. Prentiss & Co.,
HOLYOKE, MASS.,
MANUFACTURERS OF
IRON WIRE.

Bright, Coppered, Annealed and Tin
Plated. Also GUN SCREW WIRE
Of all sizes straightened and cut to order.

OLD COLONY RIVET CO.
KINGSTON, MASS.
RIVETERS AND ALL OTHER
NORWAY IRON
1/2 IN DIAM & SMALLER.
ALL LENGTHS & STYLES.

GRANITE ROOFING
(PATENTED)
For Steep or Flat Roofs. Felt and Burlap com-
bined. A finished roofing; easy to lay, strong,
elastic, durable and cheap. BEST ROOF FOR FUR-
NACES, Acks and sulphur have no effect on it.
Send for circular and sample.
THE GRANITE ROOFING COMPANY,
14th and Washington Ave., Philadelphia.


PHILIP L. MOEN,
President & Treasurer.
CHARLES F. WASHBURN,
Vice President & Secretary.
Washburn & Moen Mfg. Co.
Established, 1831. Capital, \$1,500,000
WORCESTER, MASS.
WIRE DRAWERS.
Patent Galvanizing, Rolling and Tempering.
MANUFACTURERS OF
IRON, AND IRON AND STEEL WIRE
Of Every Description.
A SPECIALTY MADE OF
GALVANIZED TELEGRAPH WIRE,
GALVANIZED TELEPHONE WIRE,
PATENT STEEL WIRE BALE TIES,
PATENT STEEL BARB FENCING,
AND PUMP CHAIN.
WAREHOUSES: New York, 16 Cliff and 241 Pearl Street.
Chicago, 107 and 109 Lake Street.

HOWARD & MORSE,
Warehouse, 45 Fulton Street, New York,
MANUFACTURERS OF
BRASS COPPER AND IRON WIRE CLOTH.

No. 4 Mesh, No. 24 Wire. No. 8 Mesh, No. 18 Wire.
No. 14 Mesh, No. 21 Wire. No. 16 Mesh, No. 23 Wire. No. 18 Mesh, No. 25 Wire.

THE TRENTON IRON CO.,
TRENTON, NEW JERSEY.
IRON
WIRE,
STEEL
WIRE.
WIRE
RODS.

BRAZIER
RODS,
BAR
IRON,
COPPERAS.
New York Office, - - COOPER, HEWITT & CO., 17 Burling Slip.
Philadelphia Office - - 21 North Fourth Street.

WIRE ROPE
HAZARD MFG CO
WAREHOUSES:
87 LIBERTY STREET, NEW YORK.
Works: WILKESBARRE, PA.
This Advertisement Changed Weekly.

IOWA BARB WIRE CO.,
87 Liberty St., NEW YORK. 89 Lake St., CHICAGO.
RECEIVED THE AWARD FOR BARB WIRE AT
ATLANTA COTTON EXPOSITION.
87 Liberty St., NEW YORK. 89 Lake St., CHICAGO.
STAUFFER, MACREADY & CO., New Orleans, La.
CARLIN & FULTON, Baltimore, Md.
BAKER & HAMILTON, San Francisco and Sacramento, Cal.
Factory,
JOHNSTOWN, PA.

A. LESCHEN & SONS,
Manufacturers of
WIRE ROPE
Hemp Packing,
Twines.
Tarrad Lathym,
Manila Rope.
903 & 905 N. Main St., ST. LOUIS, MO. Correspondence invited.

LAWRENCE MENDENHALL,
Manufacturers' Agent.
HARDWARE SPECIALTIES INTRODUCED & SOLD.
55 West Fourth Street, CINCINNATI, OHIO.
General Agent for Huggins Window Balance, Hemacite Goods, Automatic Awning Fixtures, Bodel
Mitering Machine and Wilson's Rolling Steel Shutters.
Correspondence solicited. Box 117, Builders' Exchange. Factory prices quoted.

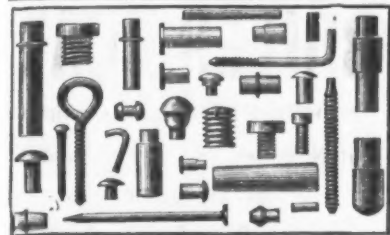
O. LINDEMANN & CO.,
Manufacturers of
Japanned, Brass,
Tin Plated
and Wood
**BIRD
CAGES.**
Original inventors
and patentees of
Bright Metal Cages,
constructed without
solder.
**254 Pearl St.,
NEW YORK.**



CARY & MOEN,
Manufacturers of
STEEL WIRE for all purposes and **STEEL SPRINGS** of every description.

Market Steel Wire, Crinoline Wire, tempered and covered.
Also Patent Tempered Steel Furniture Springs, constantly on hand.
234, 236 and 238 West 29th Street, NEW YORK.


THE FRED. J. MEYERS MANUFACTURING CO.,
COVINGTON, KY.,
Manufacturers of
WIRE GOODS OF ALL KINDS,
Wrought-iron Fencing, Cresting and Hardware Specialties.
Send for Illustrated Catalogue.

IRON AND BRASS RIVETS,
Studs, Pins, Screws, &c.,
For Manufacturers of Light Hardware.
BLAKE & JOHNSON, Waterbury, Conn.

LUDLOW-SAYLOR WIRE CO.,
ST. LOUIS, MO.


CLEVELAND WIRE WORKS
W. S. Tyler
MANUFACTURER OF
STEEL WIRE CLOTH
Of Every Description,
for mining purposes. All meshes from 2 to 12
inch up to 100-mesh made and carried in stock.
CLEVELAND, OHIO.

FOR PRICES ON
FLY TRAPS, DISH COVERS,
WIRE CLOTH,
Scrub, Shoe, Whitewash and Other Brushes.

**THE BROMWELL BRUSH
& WIRE GOODS CO.,**
CINCINNATI.

Established 1819. Incorporated 1883.
G. M. HOTCHKISS & CO.
West Haven, Conn.,
MANUFACTURERS OF
Brass, Iron & Steel Keys,
Locksmiths' and Bellhangers' Supplies,
HARDWARE SPECIALTIES.
Illustrated Catalogue Furnished on Application.
Also Brass and Nickel Plated
Suspender Buckles.
NOVELTIES OF ALL KINDS, MADE EITHER OF
SHEET METAL OR WIRE, A SPECIALTY.

PETER WRIGHT'S
PATENT
SOLID ANVILS
ALFRED FIELD & CO.,
93 Chambers Street,
NEW YORK HEADQUARTERS.


BURTON'S OPEN LINKS
Ewald Over
Indianapolis,
Ind., Manu-
facturer. For
Sale by Hard-
ware Dealers
Everywhere.
Send for Cir-
culars, Prices
Terms, etc.
Large prof-
its to Agents.

Mercer Wire Co.,
TRENTON, N. J.,
MANUFACTURERS OF
**IRON AND STEEL WIRE, CAST-
STEEL SPRING WIRE.**
Umbrella, Clock and Flat Wire
A SPECIALTY.
Corner Schenck and Third Streets

**THE ELLIPTIC CARRIAGE
and WAGON SPRINGS** made by
the **GAUTIER STEEL DEPART-
MENT** of the Cambria Iron
Co., Johnstown, have been
so improved in quality and
finish that they now stand at
the head of the trade for dura-
bility and handsome appear-
ance. Leading sizes always
in stock.

NEW YORK OFFICE:
104 Hende St.

[No. 68.]


PHILADELPHIA OFFICE:
523 Arch St.

CHARLES A. OTIS, President. SAM'L ANDREWS, Vice President. SAM'L A. SAGUE, General Manager.
THOS. JOPLING, Treasurer. JOHN C. ANDREWS, Secretary.
THE AMERICAN WIRE COMPANY,
DRAWERS OF
IRON AND STEEL WIRE OF EVERY
DESCRIPTION
TELEGRAPH AND TELEPHONE WIRE.
GALVANIZED, TINNED AND COPPERED WIRE.
WIRE STRAIGHTENED AND CUT TO LENGTHS.
EASTERN OFFICE: Room 24, Astor House Office, New York. E. C. PALMER, Agent.
WESTERN OFFICE: 61 Lake St., Tremont House Block, Chicago. BEN. PATTERSON, Agent.
CLEVELAND, OHIO.

J. A. EMERICK **HOWARD EVANS,**
MANUFACTURERS
MOLDERS' TOOLS,
FOUNDRI FACING,
MOLDING SAND,
FOUNDRI SUPPLIES.
J. A. EMERICK & CO.,
1056 to 1076 Beach St., PHILADELPHIA.



W. P. SUMNER, Pres. J. R. MINCKLER, Sec'y.
National Wire & Iron Co.
Detroit, MANUFACTURERS OF Mich.
Iron Stairs, Iron Shutters, Roof Cresting, Weather Vanes, Wire Signs,
Illuminated Sidewalk Tile, Wire Counter Railings, Wire Cloth, Cheese Saws,
Wire & Iron Fences, Stable Fixtures, Casting Brushes, Counter Supports,
Sand & Coal Screens, &c.
Send for Catalogue. Mention this Paper.


The above cut represents Preston's Patent Braided Cable Wire Fence Rail, manufactured by the
HOLLOW CABLE MFG. CO., Hornellsville, N. Y. We also manufacture extensively
four different sizes Wire Clothes Lines. Send for Circulars and Price Lists.
Chamberlain, Coxe & Millar, Western Agents, 89 Lake St., Chicago, Ill.

ESTABLISHED 1848. INCORPORATED 1870.
WM. CABLE EXCELSIOR WIRE MFG. CO.,
43 FULTON STREET, NEW YORK,
MANUFACTURERS OF ALL KINDS OF
Brass, Copper and Iron Wire Cloth,
AND BRASS AND COPPER WIRE,
Coal and Sand Screens, Riddles, &c.

WIRE, WIRE CLOTH, WIRE ROPE,
Counter Railings, Window Guards, Iron and Wire Fences,
PLAIN AND BARBED FENCING WIRE.
ESTABLISHED 1837. INCORPORATED 1876.
H. S. CHASE, Sec'y. C. F. POPP, Treas.

Waterbury Mfg. Co.,
WATERBURY, CONN.


Brass Goods.


ROOF CRESTING AND FINIALS,
Weather Vanes, Tower Ornaments, &c.
WROUGHT IRON FENCES,
Iron Shutters, Window Guards, Jail Work, &c.,
BANK AND OFFICE RAILINGS,
WIRE AND IRON WORK of Every Description.
THE E. T. BARNUM WIRE & IRON WORKS,
Detroit, Mich., U. S. A.

THOMPSON McCOSH, President. JOHN A. McCOSH, Sec. and Treas.
BARB WIRE **LIFTER AND CARRIER.**

NO DANGER OF CUT-
TING HANDS OR TEAR-
ING CLOTHES.
SAVES THE PRICE OF
THE LIFTER MANY
TIMES EVERY DAY.
Manufactured
Solely by
Hawkeye Steel Barb Fence Co.,
BURLINGTON, IOWA.


**PATENT FOLDING
IRON WINDOW GUARDS AND GATES.**
Can be extended and locked for protection, and folded away when not in use.
COMPOSITE IRON WORKS CO.,
93 Church Street, Corner Rensselaer Street, New York.
COMPOSITE IRON RAILINGS.
Send for "Folding Gate Catalogue."


SELF-OPENING BOLLES' SELF-OPENING GATE.
IRON GATE. The Cheapest and Best in the World.
No rods in the ground to get out of order. Used with ordi-
nary wood posts and easily set up.
Sample Gate with Trimmings, only \$20.
J. E. BOLLES & CO., Wire and Iron Works,
Inventors and Sole Manufacturers, Detroit, Mich.
MENTION THIS PAPER.
A reliable agent wanted in each town, to whom
liberal inducements will be offered.

FELTEN & GUILLEAUME,
Carlsberg, near Cologne, Germany.
PATENT CRUCIBLE STEEL WIRE,
For Mining and Plow Ropes, Hawsers and Bridge Cables.
SIEMENS-MARTIN & BESSEMER **GALVANIZED TELEGRAPH WIRE**
STEEL WIRE, 
Flussisen, Swedish and German
Charcoal Wire.
GALVANIZED STEEL WIRE,
For Plain, Barb and Strand Fencing, 3, 4 and 7-ply Strand, Staples, &c. Annealed and Oiled Fencing
Wire, round and oval.


**PATENT GALVANIZED
STEEL BARB FENCING,**
For Export.
**2 BARB, 4 BARB AND
THICKSET.**

WIRE ROPE OF EVERY DESCRIPTION. TELEGRAPH CABLES.
Contractors to the German and Foreign governments. The oldest house in the branch on the Con-
tinent. **Telegraph Address, CARLSBERG, COLOGNE.**
General Agents for U. S.,
PERKINS & CHOATE, 34 Pine St., N. Y.

OGDEN & WALLACE,
85, 87, 89 & 91 Elm St., New York.
Iron and Steel
Of every description kept in stock.
Agents for Park Brother & Co.'s
BLACK DIAMOND STEEL.
All sizes of Cast and Machinery Steel constantly on hand.

PIERSON & CO.,
ESTABLISHED 1790,
24 to 27 West St., cor. Morris,
NEW YORK CITY.

ULSTER IRON.
All Sizes and Shapes Kept in Stock.

NORWAY IRON
ROUNDS..... 1/2 in. to 1 in.
SQUARES..... 1/2 in. to 1 1/2 in.
FLATS..... 1/2 in. to 3 1/2 in.
SPECIAL PRICES FOR LOTS.
ALSO GENERAL ASSORTMENT OF
"ULSTER," "CATASAUQUA," "A. R. M. Co."
SHAFTING, REFINED & COMMON IRON.
BANDS, HOOPS & SCROLLS. STEEL
OF ALL KINDS.
ABEEL BROS.,
190 SOUTH ST., NEW YORK.
363 WATER ST., NEW YORK.
TELEPHONE CALL, "NASSAU, 379."

A. R. WHITNEY & CO.,
58 Hudson Street,
NEW YORK,
OFFER

Portage Iron Co., Lim.,
DUNCANVILLE, PA.,

BESSEMER SOFT STEEL,
of all Merchant sizes, to take the place of
LOW MOOR NORWAY
and all fine grades of iron.

**H. P. NAIL CO.'S BARBED & SMOOTH
STEEL WIRE NAILS.**

BORDEN & LOVELL,
Commission Merchants,
70 & 71 West St.,
NEW YORK.

Agents for the sale of
Fall River Iron Co.'s Nails,
Bands, Hoops & Rods,
AND
**Borden Mining Company's
Cumberland Coals.**

**WILLIAM H. WALLACE & CO.,
IRON MERCHANTS**
Cor. Albany & Washington Sts.,
NEW YORK CITY.

VOUGHT & WILLIAMS,
DEALERS IN
**MACHINERY, TIRE AND
SPRING STEEL.**
AGENTS FOR HELLER & BROS.
CAST TOOL STEEL.
288 GREENWICH STREET, NEW YORK.

PASSAIC ROLLING MILL CO.,
Manufacture and have always in stock
ROLLED IRON BEAMS,
Channels, Angles, Tees, Merchant Bars, Riveted Work,
Forgings, Eye Bars, &c.
PATERSON, N. J.
Room 45, Astor House, New York.

CUT NAILS.
Hot Pressed Nuts, Bolts, Washers, &c.
**DOVER IRON CO.'S
BOILER RIVETS,**
Boiler Brace Jaws, Socket Bolts, &c.,
FULLER BROTHERS & CO.
139 Greenwich Street, New York.

Marshall Lefferts & Co.,
90 Beekman St., New York City,
MANUFACTURERS OF

Galvanized Sheet Iron,
Best Bloom, Best Refined and Common.
Galvanized Wire Telegraph and Fence; Galvanized
Hoop and Band Iron, Galvanized Rod and Bar Iron,
Galvanized Nails, Galvanized Chain, Galvanized Iron
Pipe.

CORRUGATED SHEET IRON
For Roofing, &c., Galvanized, Plain or Painted.
Best Charcoal, Best Refined and Common
SHEET IRON.

Plate and Tank Iron,
C No. 1, C. H. No. 1, C. H. No. 1 Flange, Best Flange,
Best Flange Fire Box, Circles.

ALL DESCRIPTIONS OF
Iron Work Galvanized or Tinned to Order.
Price list and quotations sent upon application.

ROME MERCHANT IRON MILLS,
ROME, N. Y.,
Manufacturers of the best grade of

Bar Iron, Bands and Fine Hoops.
scrolls, Ovals, Half Ovals, Half Rounds, Hexagon and
Horse Shoe Iron. Also from Charcoal Pig a superior
quality of iron branded J. G. All puddled balls re-
duced by hammer. Orders may be sent to the Mill or
to J. G. CARPENTER, our Agent, at 59 John
Street, New York.

FOX & DRUMMOND,
RAILWAY AND ROLLING MILL
MATERIAL,
68 Wall Street, NEW YORK.

JAMES WILLIAMSON & CO.,
SCOTCH AND AMERICAN

PIG IRON,
No. 63 Wall St., New York.

ULSTER IRON WORKS.
90 Broadway, New York.

Tuckerman, Mulligan & Co

CARMICHAEL & EMMENS
130, 132 & 134 Cedar St., New York, and
Nos. 21, 23, 25 & 7 West Lake St., Chicago, Ill.
DEALERS IN

IRON AND STEEL BOILER PLATE.
Lap-Welded Boiler Tubes, &c., &c.
Agent for The Costello Iron Co. The Laurel Roll-
ing Mills, and Union Tube Works; Wrought Iron
Beams, Angles, Tees, Rivets, &c.

DANIEL F. COONEY,
55 Washington St., N. Y.
**BOILER PLATES AND SHEET IRON,
LAP-WELDED BOILER FLUES,**
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.
Agency for Glasgow Iron Co., Jos. L. Bailey & Co.
Pine Iron Works, Leobann Rolling Mills, Chester
Pipe and Tube Co., Albany & Rens. Iron and Steel
Co.'s celebrated Boiler Rivets; Homogeneous Steel,
Boiler and Fire-box Plates.

C. W. LEAVITT. EDW'D CORNING.
C. W. LEAVITT & CO., 161 BROADWAY,
NEW YORK.

RAILS, LOCOMOTIVES AND CARS.
PIG AND BAR IRON, OLD RAILS AND SCRAP IRON.
(ALLENBOW ROLLING MILLS,
ATWOOD HEMP CAR WHEEL CO.,
PARDEE CAR & MACHINE WORKS.)

A. R. WHITNEY & CO.,
MANUFACTURERS OF AND DEALERS IN
Iron and Steel

AGENCIES:
PORTAGE IRON CO., Limited, Merchant Iron and
Soft Steel.
NORWAY STEEL & IRON CO., Homogeneous
Steel Plates.
BAY STATE IRON CO., Tank, Boiler and Girder
Plates.
BRANDYWINE ROLLING MILL, Boiler Plates.
GLASGOW TUBE WORKS, Boiler Flues.
A. M. BYERS & CO., Wrought Iron Pipe.
CARNegie BROS. & CO., Limited, Iron and
Steel Beams, Channels, Shapes and Shafting.
H. P. NAIL CO.'S Steel Wire Nails.

Plans and estimates furnished and contracts
made for erecting Iron Structures of every descrip-
tion. Books containing cuts of all iron made sent
on application by mail. Sample pieces at office.
Please address 55 Hudson St. New York.

OXFORD
IRON AND NAIL CO.,
Cut Nails
AND
SPIKES.

J. S. SCRANTON, Sales Agent,
81, 83 and 85 Washington Street,
NEW YORK.

JOHN W. QUINCY & CO.,
98 William St., New York,
Anthracite, Charcoal, Scotch and
English Pig Iron.
Cut Nails, Ingot Copper, Tin, Lead, and
Metals Generally.

HARRISON & GILLOON
IRON AND METAL DEALERS,
525, 526, 528 WATER ST., & 323, 324, 326 CHERRY ST.,
NEW YORK.
have on hand, and offer for sale, the following:
Scotch and American Pig Iron, Wrought, Cast and
Machinery Scrap Iron, Car Wheels, Axles and Heavy
Wrought Iron; also old Copper, Composition, Brass,
Lead, Pewter, Zinc, &c.

**BURDEN'S
HORSE SHOES.**

"Burden Best"
Iron
Boiler Rivets.

The Burden Iron Company
Troy, N. Y.

EGLESTON BROS. & CO.,
166 South Street, NEW YORK CITY.
267 Front Street,

**BURDEN'S
H. B. & S.**

AND
ULSTER BAR IRON.

All sizes and shapes in stock.
Also Best Grades of
Am. & Eng. Ref'd Iron, Common Iron, &c.
**IMPORTED & AMERICAN
PIG IRON.**

LAKE SUPERIOR CHARCOAL IRON,
For Malleable and Car-Wheel Purposes,
A SPECIALTY.

CHARLES HIMROD & CO.,
CHICAGO AND DETROIT.

F. W. JESUP & CO.,
Railway Supplies and Equipment.
No. 67 Liberty St., NEW YORK.

Agents NASHUA IRON AND STEEL CO.,
Manufacturers of
STEEL LOCOMOTIVE TYRES, HOMOGENEOUS
STEEL BOILER PLATES, IRON AND STEEL AXLES,
CRANK PINS, PISTON RODS, SLIDES, &c.
IRON AND STEEL LOCOMOTIVE FORGINGS.

B. F. JUDSON,
Importer of and Dealer in
SCOTCH AND AMERICAN
Pig Iron,
Wrought & Cast Scrap Iron,
OLD METALS.

457 & 459 Water St., NEW YORK.
233 & 235 South St.,

A. R. WHITNEY & CO.,
58 Hudson Street,
NEW YORK,
OFFER

Carnegie Bros. & Co., Ltd.,
STEEL
BEAMS, CHANNELS, PLATES
AND SHAFTING
At Same Price as Iron.

W. D. WOOD & CO., L'd



Planished Sheet Iron.
Patented March 14th, 1865; April 8th, 1873;
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the
IMPORTED RUSSIA IRON,
and at a much less price.

FOR SALE
by all the principal
METAL DEALERS
In the Large Cities throughout
THE UNITED STATES,
And at their Office,
111 Water Street, PITTSBURGH, PA.

**SYRACUSE MALLEABLE
IRON WORKS,**
SYRACUSE, N. Y.

Mower and Reaper Castings
and Carriage Irons a
Specialty.

W. B. BURNS, Proprietor.

PENNSYLVANIA IRON WORKS
Everson, Brown & Co.,
SECOND AVE., PITTSBURGH, PA.,
MANUFACTURERS OF

Light Sheet Iron.
ROOFING SHEET
of all grades a specialty.
Prices quoted promptly upon application.

CORRUGATED AND CRIMPED IRON
ROOFING & SIDING,
Iron Buildings, Roofs,
Shutters, Doors, Cornices,
Skylights, Bridges, &c.

MOSELEY IRON BRIDGE AND ROOF CO.,
5 Day Street, New York.

GLENGARNOCK AND CARNBROE SCOTCH PIG IRON.
For spot delivery, and for prompt or forward shipments to New York, Boston, Philadelphia,
Baltimore or New Orleans. For sale by
JAMES LEE & CO., Sole Agents for the United States.
72 Pine Street, NEW YORK.
101 Milk Street, BOSTON, MASS. 170 Washington Street, CHICAGO.

LEECHBURG IRON WORKS.
KIRKPATRICK & CO.,
Manufacturers of all grades of
FINE SHEET IRONS,
Redned Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel, Ferrule Iron, &c.
NATURAL GAS USED AS FUEL.
OFFICE, No. 143 First Ave., Pittsburgh, Pa. WORKS, Leechburg, Pa.

OHIO STEEL BARB FENCE CO.
FOOT OF CASE AVE., CLEVELAND, OHIO.
EASTERN OFFICE, 105 JOHN ST., NEW YORK CITY, U. S. A.
Licensed.

The Highest Four Pointed Barbed Wire in the Market.
THEREFORE THE CHEAPEST.
Orders from Eastern markets and Seaboard promptly filled from stock in New York City. Samples
and Circulars furnished on Application.

ESTABLISHED 1818. INCORPORATED 1874.
THE GILBERT & BENNETT MFG. CO., 42 Cliff Street, NEW YORK.
Manufacturers of
Iron & Galvanized Wire
Sieves and Wire Cloth.
Power Loom Painted and Gal-
vanized Window Screens, Wire
Cloth, Galvanized Wire Cloth for
Drying Fruits, World's Galvanized
Web Wire, Fence, Galvanized
Twist Wire, Poultry Netting.

Factories, Georgetown, Cons.
ALEXANDER BURNS, Manager.

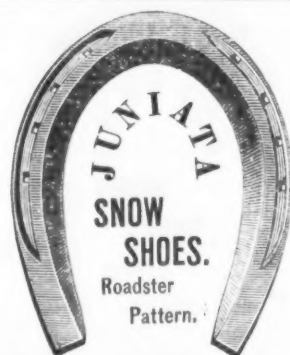
THE JERSEY CITY GALVANIZING CO.,
MANUFACTURERS OF
GALVANIZED MATERIAL OF EVERY DESCRIPTION.
GALVANIZING IN ALL ITS BRANCHES.
Galvanized Sheet Iron—Best Bloom, Best Refined, Common. Galvanized Round, Square Band and
Hoop Iron, &c., &c.

All Sizes
of Corrugation
from
1 1/2 to 5 inches.

All Gauges
and
Sizes
of Sheets.

Corrugated Sheet Iron a Specialty, Galvanized, Black and Painted. Iron Corrugated for the Trade
Estimates furnished on application.

WORKS GREEN AND BAY STREETS, JERSEY CITY N. J. OFFICE AND WAREHOUSE, 98 JOHN STREET, NEW YORK.



STEEL TOE CALKS.
Extra Quality Homogeneous Steel

BOILER PLATE
STEEL PLATES, all descriptions.
Cut Nails and Spikes, Plate and Sheet
Iron, all descriptions.

SHOENBERGER & CO., Pittsburgh, Pa.

WHEELING NAILS.
Laughlin Nail Co.,
Junction Iron Co.,

W. K. ROSS,
GENERAL AGENT.
97 Chambers Street, New York.

Manhattan Rolling Mill.

J. LEONARD,
445 to 451 West St., 177 & 179 Bank St.,
NEW YORK,
Manufacturer of

HORSE SHOE IRON,
Toe Calk Steel,
Rods, Ovals, Half Ovals and Flats.

KEystone ROLLING MILL, Limited.
Manufacturers of

IRON
Pittsburgh, - - - Pa.

Bonnell, Botsford & Co.,
Iron, Nails & Spikes.

YOUNGSTOWN, OHIO.

WILLIAM R. HART & CO.,

AMERICAN AND FOREIGN
PIG IRON, SPIEGELEISEN,
 Stee Blooms, Crop Ends, Tin Plates, &c.
 No. 224 South Third St. PHILADELPHIA.

HENRY LEVIS & CO.,

Manufacturers' Agents
 For Iron and Steel Rails, Car Wheels, Boiler and
 Sheet Iron and General Railway
 Equipments.
 Old Rails, Axles, and Wheels bought and sold.
 334 S. 4th St., Philadelphia.

Heavy Rails, Light Rails,
Railway Fastenings,
STREET RAILS.
Cambria Steel Rails.
 ADDRESS:
Cambria Iron Co.,
 Office, 218 South Fourth St., Philadelphia, Pa.
 Works, Johnstown, Pennsylvania.

THE PHOENIX IRON CO.,

410 Walnut Street, PHILADELPHIA.
 Manufacturers of Wrought Iron
Beams, Deck Beams, Channels, Angle & Tee Bars,
 STRAIGHT AND CURVED TO TEMPLATE,
 Largely used in the construction of Iron Vessels, Buildings and Bridges.
WROUGHT IRON ROOF TRUSSES, CIRDERS & JOISTS,
 and all kinds of Iron Framing used in the construction of Fire Proof Buildings.
PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,
 and built up shapes for Iron Bridges.
REFINED BAR, SHAFING, and every variety of SHAPES IRON made to order.
 Plans and Specifications furnished. Address **DAVID REEVES, President.**
 NEW YORK AGENTS, **MILLIKEN & SMITH, 95 Liberty Street.**
 BOSTON AGENTS, **FRED. A. HOUDLETTE & CO., 19 Battery March St.**

ALAN WOOD & CO.,

MANUFACTURERS OF
 Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom
PLATE & SHEET IRON,
 No. 519 Arch St., Philadelphia, Pa.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack,
 Tank and Boat Iron; Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

JAS. ROWLAND & CO.,

Kensington Iron, Steel & Nail Works,
 990 North Delaware Ave., - PHILADELPHIA,
 Manufacturers of the
ANVIL BRAND REFINED MERCHANT BAR IRON.

Also, the James Rowland & Co. Kensington ★ Nails, cut from
 their Refined Anvil stock. Also, Plow and Cultivator Steel; Skelp
 Iron a specialty; also Rounds, Squares, Flats, Bands and Hoop
 Iron.

PENCOYD IRON WORKS.

A. & P. ROBERTS & CO.,
 MANUFACTURERS OF
BEAMS, CHANNELS, DECK BEAMS,
ANGLES, TEES, PLATES, MERCHANT BAR.

STANDARD
 SHAFTING AND ROLLED OR HAMMERED AXLES OF IRON OR STEEL.
 Office, No. 26 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

J. W. PAXSON & CO.,

DEALERS IN
MOULDING SAND,
 1021 North Delaware Avenue, PHILADELPHIA, PA.,



MANUFACTURERS
MINERAL, XX MINERAL, IXL FACING,
CHARCOAL FACING, ANTHRACITE FACING, SOAPSTONE,
LEAD FACING, RIDDLES, SHOVELS, STEEL BRUSHES.

THE ALLENTOWN ROLLING MILLS,

Manufacturers of
 Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes,
 Rivets, Bolts and Nuts, &c. Bridges and Turn Tables.
 General Office, 237 South Third St., Philadelphia. Works at Allentown, Pa.

SHENANDOAH IRON, LUMBER, MINING & MFG. CO.,

MANUFACTURERS OF
SUPERIOR COKE PIG IRON
 FROM NEUTRAL HEMATITE ORES. Also
 CHARCOAL PIG IRON AND BLOOMS FROM SAME ORES.
 Works at MILNES, PAGE CO., VA. Treasurer's Office, 132 WALNUT ST., PHILADELPHIA.
JUSTICE COX, JR., & CO., Sales Agents, 224 South 4th St., Philadelphia.



LOCOMOTIVE AND CAR-WHEEL TIRES
 Manufactured from the celebrated OTIS STEEL BRAND
STANDARD
 Quality and efficiency fully guaranteed. Prices as low
 as any of the same quality. We manufacture Heavy and
 Light Forgings, Driving and Car Axles, Crank Pins, Piston
 Rods, &c.
THE STANDARD STEEL WORKS,
 Works at LEWISTOWN, PA.
 Office: - 220 S. 4th St., Philadelphia, Pa.

Edward J. Etting,

IRON BROKER AND COMMISSION MERCHANT,
 232 S. Third St., Philadelphia, Pa.
Pig, Bar and Railroad Iron.
 OLD RAILS, SCRAP, &c.
 Agent for the
MOUNT SAVAGE FIRE BRICK,
 The Allentown Iron Co. and the
 Greenwood Rolling Mill.
 STORAGE WHARF AND YARD
 DELAWARE AVENUE ABOVE CALLOWHILL STREET,
 connected by track with railroad.
 Cash advances made on Iron.

ISAAC V. LLOYD, JAS. G. LINDSAY.
LLOYD & LINDSAY,
 No. 328 Walnut St., PHILADELPHIA,
 Brokers and General Dealers in
 Iron and Steel, Railway Equipments and
 Supplies, Bar, Plate and Sheet Iron, Pig
 Iron, Rails and Fastenings, Muck Bars,
 Blooms, Boiler Tubes, Wrought Iron Pipe, &c.
 Old Rails and Scrap Iron.
 Florida Yellow Pine, orange lots.

J. O. RICHARDSON,

No. 232 Dock St., Philadelphia,
 DEALER IN
Pig Iron, Merchant Bar Iron
and Iron Ores.

Ethelbert Watts, Jos. C. Poulterer.
ETHELBERT WATTS & CO.,
 Iron Brokers and Commission Merchants,
 Offices, No. 230 So. Third Street, Phila.
 SALES AGENTS FOR
 CORNWALL ORE BANK CO., IRON ORES.
 CROMWELL IRON CO., IRON ORES.
 VESTA FURNACE, PIG IRON.
 MARIETTA FURNACES, PIG IRON.
 Messrs. EVERETT & POST, PIG LEAD & SPECTER.
 Chicago and St. Louis.
 Correspondence Solicited.

S. F. SHARPLESS & CO.,

Selling Agents and Commission Merchants
 FOR THE SALE OF
Pig, Bloom, Plate, Bar, Scrap, Galvanized,
Black, Sheet, Pipe and Railroad
IRON,
 NO. 220 SOUTH THIRD ST., PHILADELPHIA
 Charcoal Bloom and Pig a Specialty.

L. & R. WISTER & CO.,

IRON COMMISSION MERCHANTS,
 230 So. 4th St., Philadelphia.
 AGENTS
 Kemble and Norway Foundry and Forge Pig Iron.
 Wyebrooke C. B. Charcoal Pig Iron.

ANDOVER PIG IRON,

FOR BEST MILL PRODUCTS.
 Andover Chill Iron for Carwheels, &c.
 Each pig marked exact chill depth (3/4 inch to 5/8
 inch), A. Whitney & Son's standard test.
 F. A. COMLY, Treas. J. WESLEY PULLMAN, Agent.
 407 Walnut St., PHILADELPHIA.

MORRIS, WHEELER & CO.,

IRON, STEEL & NAILS.
 WAREHOUSE AND OFFICES, SALES OFFICES
 16th & Market Sts., 400 Chestnut St.,
 PHILA., PA. PHILA., PA.
 New York Address, 14 CLIFF ST.

J. J. MOHR,

Sole Agent for
 Sheridan, Leesport, Temple,
 Lynchburg, Millcreek and Mt.
 Laurel
FOUNDRIE & FORGE PIG IRON,
CHARCOAL PIG IRON.
 430 Walnut St., PHILADELPHIA, PA.

Danville Nail and Mfg. Co.

NAILS.
DANVILLE, PA.

TESTED CHAINS.

BRADLEE & CO., EMPIRE CHAIN WORKS,
 816 Richmond St., - - - PHILADELPHIA.

MANUFACTURERS OF THE
 Celebrated "D. B. G." Special Crane and Dredging Chains.
 Careful attention given to Special Dimension Chains and those requiring extra Strength
 and Wearing Qualities.

CUMBERLAND NAIL AND IRON CO.,

MANUFACTURERS OF
"Cumberland" Nails and Wrought Iron Pipe,
 43 North Water Street and 44 North Delaware Avenue, PHILADELPHIA.

J. TATNALL LEA & CO.,

Successors to CABEEN & CO.,
IRON COMMISSION MERCHANTS,
 No. 400 Chestnut Street, Philadelphia.
 BESSEMER, MILL AND FOUNDRIE PIG IRON, SKELP IRON, MUCK AND SCRAP BARS NATIVE
 AND FOREIGN ORES. AGENTS FOR CONNELLSVILLE COKE.

BOOTH, CARRETT & BLAIR,

ANALYTICAL AND CONSULTING CHEMISTS,
 919 and 921 Chant St. 10th St. above Chestnut St., Philadelphia, Pa.
 Established in 1836.

Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the
ANALYSIS OF IRON AND STEEL,
 fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron, Steel, Iron
 Ores, Slags, Limestones, Coals, Clays, Fire Sands, &c. Agents for sampling ores in New York and
 Baltimore. Price lists on application.

JUSTICE COX, JR., & CO.,

CHARLES K. BARNES.
 AGENTS FOR
 CHICKIES, CONEVAGO, MONTGOMERY AND
 SHENANDOAH
Foundry & Forge Pig Iron.
 CARBON ROLLING MILL CO., Limited,
 Best Quality Muck Bar.
CATASAUQUA MFG. CO.'S
Bar, Angle, Skelp and Sheet Iron.
 Shenandoah (Va.) Best Charcoal Blooms.
 No. 224 So. Fourth St., PHILADELPHIA.

W. H. WALBAUM & CO.,

206 S. Fourth St., PHILADELPHIA,
 55 & 57 Pine Street, New York.
 GENERAL MERCHANDISE BROKERS.
 SPECIALTIES

NEW AND OLD RAILS,

BLOOMS, BESSEMER PIG,
Spiegeleisen Iron Ores
AND RAILROAD SUPPLIES GENERALLY.
 Agents for the United States for The
 North Lonsdale Iron and Steel Co.,
 Limited.
 Bessemer Pig Iron, brand "ULVERSTON."
 Malleable Pig Iron, brand "U. H. M."
 ALSO FOR
 N. B. ALLEN & CO.'S DINAS FIRE BRICKS.

JEROME KEELEY & CO.,

306 Walnut Place, Philadelphia.
 SELLING AGENTS FOR
 CHARCOAL AND ANTHRACITE BLOOMS, PIG IRON,
 BAR IRON, SHEET IRON, STEEL AND IRON RAILS,
 IRON CLAD STEEL RAILS AND BARS, MAGNETIC
 AND HEMATITE IRON ORES, FIRE BRICK, COAL
 AND SKE, MUCK BARS. Handle Old Iron and Steel
 Rails, Scrap Iron &c. Examine and negotiate sales
 of Iron and Coal products.

E. H. WILSON & CO.,

230 South Third Street, Philadelphia.
 BROKERS AND DEALERS IN
IRON AND STEEL.
 Correspondence solicited.

EDMUND D. SMITH,

147 So. 4th St., Philadelphia,
 BROKER FOR THE SALE OF ALL GRADES
FOREIGN & DOMESTIC IRON ORES,
 Spiegeleisen, Pig Iron and Structural Iron.

J. W. HOFFMAN & CO.,

IRON COMMISSION MERCHANTS,
 208 South Fourth St., Philadelphia,
 SELLING AGENTS.
 PINE IRON WORKS, Pine Brand Plates; GLASGOW
 IRON CO., Plates and Muck Bars; SPRANG STEEL &
 IRON CO. (Limited), Siemens-Martin (Open Hearth)
 Steel, Universal and Sheared Plates, Angles and
 Shapes.

REUBEN HAINES,

CHEMIST,
 738 Sansom St., Philadelphia.
 Analysis of Ores of Iron and other Metals,
 Pig Iron and Steel. Assay of Gold and
 Silver Ores. Water Analysis for
 Manufing and Household Use.

NORTH BROTHERS,

Iron Founders,
 LIGHT CASTINGS A SPECIALTY.
 N. W. Cor. 23d and Race Streets,
 PHILADELPHIA.
 Correspondence solicited.

JNO. L. HOGAN,

Iron Commission Merchant,
 413 WALNUT ST., PHILADELPHIA.

PIG AND BAR IRON,

Blooms, Muck Bar, Spiegeleisen, Iron Ores,
 Old Rails, Scrap, &c. Agent Brier Hill Iron
 and Coal Co. Special Foundry Irons,
 CONNELLSVILLE COKE.

New Inventions.

J. A. Demuth, of Toledo, Ohio, has
 patented a duplex check scale beam. In
 weighing cars, grain, coal and other articles,
 especially where the transactions are large
 and the operation of weighing sometimes
 hurried, many mistakes occur in entering
 the weights in the scale book. In the ordi-
 nary way of making these entries there is
 no check by which the ascertained weight
 can be rectified. The inventor provides the
 scale beam, which has the ordinary gradu-
 ations, with an additional series of letters and
 figures. These are entered in the scale book,
 together with the usual weight entries, and
 if a mistake has been made in the latter it
 may at once be detected and rectified by
 checking off the former. Moreover, a com-
 parison of the entries with the double scale
 on the scale beam will disclose whether the
 operator is accurate or careless in the dis-
 charge of his duty.

The Rogers Fence Company, of Spring-
 field, Ohio, have secured the patent right in a
 new sectional iron fence in which double
 rails are employed, the pickets being pivoted
 between them. The object of the invention
 is to dispense with the slow process of ad-
 justing the fence to grade in separate pieces
 while putting it up. To accomplish this, the
 fence is constructed in entire panels at the
 shop, ready to be set up. The members of the
 panels are connected so that each one may
 assume its relative position with respect to
 the others, when adjusted, by inclining the
 rails. The rails are also connected between
 the pickets by a clip-band, to form a bearing
 for the ornament. By this construction any
 lateral movement of the picket or its orna-
 ments is prevented, and each part of the
 fence is retained in its position relative to
 the others.

L. Weiller, of Anguleme, France, has
 patented in America, France, England and
 Italy a new alloy for making silicious copper
 and bronze. The alloy is claimed to be par-
 ticularly suited for electric conducting wire,
 and also for making guns and machinery. A
 mixture of sodium and tin is first made, after
 which copper is added to form what the in-
 ventor calls "sodium bronze." When a
 larger amount of sodium is required than
 can be conveniently combined with the tin
 to be employed in the alloy, sodium in an
 uncombined state can be used in conjunction
 with the sodium tin or sodium bronze, the
 product being introduced with fluosilicate of
 potash into the melted copper or bronze.

A sad-iron holder of new design has been
 introduced by S. M. Carnes, of New York
 City. An ordinary cloth-pad has secured to
 its center the spring-clamp for attaching it
 to the handle of the iron. The spring-clamp
 may be either fastened by loops or by stitching.
 When the iron is used, the handle will
 be properly held in place, but as soon as the
 hand is removed the pad will spread out
 laterally, thus admitting free circulation of
 air and keeping the bottom of the pad cool.

A simple and substantial device for
 attaching the knives to sickle bars has
 recently been patented by L. Wallace, of
 Kansas City, Mo. The bar is formed with a
 longitudinal groove on one side, and with
 transverse slots at regular intervals within
 the groove. The knives have lugs to engage
 beneath the solid sections dividing the slots.
 The knives are put in place in succession,
 commencing at the outer end of the bar,
 and then sliding them sideways to engage
 the lugs. The last knife is secured by a pin
 and nut.

The Helmbacher Forge and Rolling Mills
 Company, of St. Louis, Mo., are the assignees
 of a newly-patented link-welding die. The
 link, properly bent, is placed within a recess
 of the lower die. The upper die is then
 closed upon it. A central projection on the
 lower die serves to force such metal as is in
 excess of what is needed in forming the
 weld to the outer side of the recess, where it
 is formed into a fin. This fin, however,
 owing to the depth of the recess, comes
 above the center of the link. The upper
 part of the die is then raised and the link
 reversed. In this position the link is held
 over the recess by reason of the fin bearing
 upon the edge of the lower die. The upper
 part is then closed again upon the lower
 part and the fin is shorn from the link, thus
 finishing the latter.

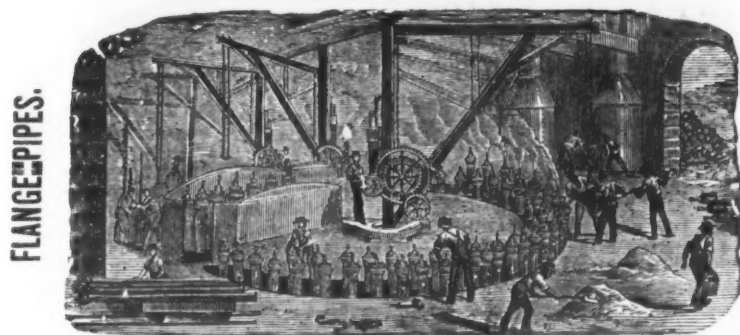
The Washburn and Moen Manufacturing
 Company, of Worcester, Mass., are the as-
 signees of a newly-patented wire-twisting
 machine. In this machine the strands of
 wire, one of which may be provided with
 barbs, are led through a tubular journal
 around one rag-wheel and thence around a
 second rag-wheel to a reel. To this reel,
 which is directly opposite the second rag-
 wheel, the ends of the wire are temporarily
 fastened. The revolution of the winding
 frame will at once twist the strands of wire
 together, and wind the twisted cable upon
 the reel. The latter is caused to travel back
 and forth, so that the twisted wire is laid
 evenly thereon. The rag-wheels accommo-
 date the barbs, and the latter do not cause
 any obstruction to the feeding of the wire.

A. B. Malin, of Cleveland, Ohio, proposes
 to spool market wire in such a manner that
 the wire cannot oxidize. The wire is to be
 wound snugly on spools of convenient size,
 so that they may be kept on hand like spools
 of thread for general household use. The
 wire is wound in such close coils, and under
 such a strong pressure, that the inner coils
 are fully protected from the atmosphere by the
 coils outside. The outside coil presents an
 unbroken surface which may be coated with
 varnish or other suitable substance, which
 fully protects it from rusting.

One of the steps in the manufacture of
 Russia or planished sheet-iron consist in
 subjecting the sheets, just as they are taken
 from the reheating or annealing furnace, to
 the action of superheated steam. The sheets
 are then at a bright red heat, and covered
 with ashes and unconsumed charcoal, and
 the object of the process is to produce a
 magnetic oxide on their surface. W. D.
 Wood, of Pittsburgh, Pa., has constructed
 an apparatus for applying the superheated
 steam, and for sprinkling and cleaning off
 the sheets after being acted on by the steam.
 The sheets are taken from the furnace in
 packs composed of some 50 or 60 sheets.
 They are immediately, while at a red heat,

A. H. McNEAL,

BURLINGTON, N. J.



CAST IRON PIPES,

FOR WATER AND GAS.

ESTABLISHED IN 1848.

SINGER, NIMICK & CO., Limited,

PITTSBURGH, PA.,

MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

STEEL,

Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequalled for surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plow Steel.

Iron Center "Cast Plow Steel." Finished Rolling Plow Coulters, with Patent Screw Hubs. Agricultural Steel cut to any pattern desired. [attached.] "Soft Steel Center" "Cast Plow Steel." Steel Forgings made to order. "Solid Soft Center" "Cast Plow Steel."

Represented at 243 Pearl & 18 Cliff Sts., New York, & 417 Commerce St., Philadelphia, by HOGAN & SON, General Agents for Eastern and New England States.

THE MIDVALE STEEL COMPANY,

CRUCIBLE AND OPEN-HEARTH STEEL.

TIRES and AXLES

OF EVERY DESCRIPTION.



Tool, Machinery and Spring Steel Castings and Forgings.

Works and Office,

Nicetown, Philadelphia, Pa.

Warehouse,

12 N. 5th St., Philadelphia, Pa.

"THE FRANKFORD STEEL WORKS,"

STEEL FORGINGS,

NONPAREIL TOOL STEEL, MACHINERY STEEL.

FRANKFORD, PHILADELPHIA, PA."

ESTABLISHED 1847.

A. WHITNEY & SONS,

PHILADELPHIA,

CHILLED RAILROAD WHEELS

For every kind of service, including Street, Mine and Lumber Tramways. Wheels furnished in rough bored or on axles. Chilled castings made to order.

PENNSYLVANIA STEEL COMPANY,

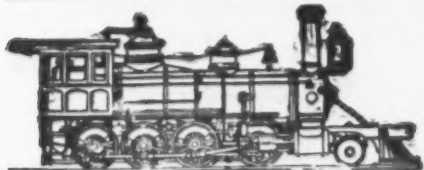
Steel Rails, Frogs, Crossings & Switches.

Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.

Address all orders to

PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.



BALDWIN LOCOMOTIVE WORKS.

BURNHAM, PARRY, WILLIAMS & CO., Proprietors

Philadelphia, Pa., U. S. A.

Manufacturers of LOCOMOTIVE ENGINES of every Description.

Catalogues, photographs and estimates furnished on application of customers.

NOISELESS STEAM MOTORS, For city and suburban Railways.

These machines are nearly noiseless in operation: show no smoke with the use of anthracite coal or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse-

cars and draw additional cars. Circulars with full particulars supplied.

L. HERNSHEIM,
Manufacturers' Agent and Commission Merchant,
No. 20 Nassau St., NEW YORK.
STEEL RAILS, BLOOMS AND WIRE RODS,
Bessemer, Scotch and Charcoal Pig Iron,
FERROMANGANESE SPIEGEL IRON, SCRAP IRON &c., &c.

BRITTON IRON AND STEEL CO.,
MANUFACTURERS OF
IRON AND STEEL BOILER PLATE,
Tank, Bridge and Ship Plates,
BLACK AND GALVANIZED SHEET IRON.
Works foot of Wason St., cor. L. S. & M. S. R. R., CLEVELAND, O.

CHARLES HUBBARD,
"SHERIDAN," "LEESPORT," } BRANDS PIG IRON.
"MT. LAUREL" & "TEMPLE" }
"CHARCOAL" PIG IRON, "MAIDEN CRUEK" and "NEW RIVER MINERAL" BRANDS.
FAVORITE BRANDS OF SCOTCH PIG IN STOCK AND TO ARRIVE.
Old Car Wheels, Best Brands. 46 Cliff Street, New York City.

Established - - - 1861.
THOMAS C. BURROWS,
Agent for Jas. R. Thompson & Co.,
Manufacturers of **STEEL** Of All Descriptions.
WAREHOUSE, 99 and 101 JOHN ST., NEW YORK.

CALUMET IRON & STEEL CO.,
MANUFACTURERS OF
OPEN HEARTH STEEL, PIG METAL,
MERCHANT BAR, IRON AND NAILS,
SIEMENS OPEN HEARTH STEEL CASTINGS FOR
RAILROAD, MACHINERY AND AGRICULTURAL PURPOSES.

Offices, First National Bank Building, Chicago, Ill.
C. R. CUMMINGS, President.
D. C. BRADLEY, Vice Pres. and Gen'l Man. } Works at Cummings,
J. M. BROWN, Sec'y & Treas. } Cook County, Ill.

Grove, Grier & Co., Limited,

Makers of

Open Hearth Steel Plates,

For Locomotive and Marine Boilers, Ship and Tank Plate, Spring, Tire, Machinery, Agricultural Steel, &c.

Office:

330 Walnut Street, - Philadelphia.
Furnace and Mills, Danville, Va.

HARTMAN STEEL CO., Lim.,

Beaver Falls, Pa.,

MANUFACTURERS OF

WIRE NAILS

Of Every Description.

SEND FOR ILLUSTRATED PRICE LISTS TO

Page, Dennis & Co.,

325 Broadway, NEW YORK.

Page, Middleton & Co.,

PHILADELPHIA AND BALTIMORE.

Agents for Middle and Southern States.

STANDARD STEEL CASTING CO.,

THURLOW, PA.,

Open Hearth and Crucible STEEL CASTINGS.

CASTINGS made to any Pattern weighing from a fraction of a pound up to 20,000 pounds.

QUALITY EQUAL TO STEEL FORGINGS.

Can be Bent, Welded or Forged.

STEEL INGOTS, Best Stock, Furnished to Order.

Ship Patterns direct to Thurlow, Pa., via P. W. & B. R. R., or via P. & R. R. R.

We are prepared to make all kinds of Heavy or Medium Weight

STEEL CASTINGS

FROM

OPEN HEARTH METAL.

We wish to give special attention to making Cast Steel Rolls of all sizes, Mill Gearing wherever Cast Steel is suitable. Also Cranks, Cross Heads, Shafts, &c., for Steam and Blowing Engine construction.

Being desirous of securing a share of public patronage, we will endeavor to make our product equal in quality to any in the market.

MACKINTOSH, HEMPHILL & CO., Limited,

PITTSBURGH, PA.

FOR STEEL CASTINGS.

SILICA MOLDS

We are licensing Steel Companies for the use of our Silica Molds for Steel Castings. Reference may be had to the Otis Iron and Steel Co., Cleveland, Ohio; Benj. Atha & Co., Newark, N. J., and the Calumet Iron and Steel Co., Chicago, Ill., who are manufacturing under our patent. For particulars, terms, &c., address

COWING STEEL CASTING CO., CLEVELAND, OHIO.

WROUGHT IRON Boiler Tubes,

Steam, Gas and Water Pipe.

Oil Well Tubing, Casing and LINE PIPE.

Cotton Presses, Forgings, ROLLING MILL AND General Machinery.

READING IRON WORKS,
261 S. Fourth St., Philadelphia.



WITHEROW & GORDON,
Engineers & Contractors,
PITTSBURGH, PA.

Agents for the

WHITWELL HOT BLAST STOVES.

OVER 600 IN USE.

The following parties either have them in use or under construction:
Cedar Point Iron Co., N. Y.
Dunbar Furnace Co., Pa.
Crane Iron Co., Pa.
Pennsylvania Steel Co., Pa.
Neshannock Iron Co., Pa.
R. H. Coleman, Lebanon, Pa.
Chester Rolling Mill Co., Pa.
Davenport, Fairbairn & Co., Pa.
Isabella Furnace Co., Pa.
Faxon Furnaces, Pa.
Spearman Iron Co., Pa.
Eina Iron Works, Ohio.
Milton Coal and Iron Co., Ohio.
Winona Furnace Co., Ohio.
Yoss & Marshall, Ohio.
H. Campbell & Sons, Ohio.
Hocking Valley Iron Co., Ohio.
Cleveland Rolling Mill Co., Ohio.
Meier Iron Co., Ill.
North Chicago Steel Co., Ill.
Union Iron and Steel Co., Ill.
Means & Culbertson, Ky.
Ashland Furnace Co., Ky.
Spartan Iron Co., Ky.
Southern States C. I. and S. Co., Tenn.
Sevance Furnace Co., Tenn.
James C. Warner, Rising Fawn, Ga.
Ohio Iron Co., Zanesville, O.
Sloss Furnace Co., Ala.

COLD ROLLED
Steel Figures and Letters.
SEND FOR CIRCULAR.
Bellows & Dickey,
145 Seneca St., Cleveland, O.

J. P. SWENEY & CO.,
613 N. Main Street, ST. LOUIS, MO.,
SELLING AGENTS FOR MANUFACTURERS OF
METALS, MACHINERY and RAILWAY SUPPLIES.
Correspondence solicited.

WILLIAMS, WHITE & CO.,
MOLINE, ILLINOIS.
MANUFACTURERS OF
DROPHAMMERS,
HORIZONTAL PRESSES FOR BENDING IRON,
GANG BORING MACHINES, TOOLS FOR PLOW MAKERS
THE JUSTICE HAMMER.
SEND FOR CIRCULARS.

VARIETY METAL BOOM.
Iron Foundry and Machine Shop.
STEAM HEATING BY DIRECT RADIATION
In all its Branches a Specialty. Brass and other Metal Moulding, Casting and Finishing. Noiseless Vertical Engines, Hydrants, Fire Plugs, &c.
FRAS. B. BANNAN,
Pottsville, Schuylkill Co., Pa.

BASE BALLS, BATS,
AND
UNIFORM MANUFACTURERS.
League and Association Balls, and all Outfit Fishing Tackle, Tents, Gymnasium Goods, Canoes, Seine Makers, The Rink Roller Skates, Saddle Bags, and Leggings Makers.
166 Main Street, CINCINNATI, OHIO.
B. KITTREDGE & CO.

RR CAR WHEELS
CASTINGS
MOWLER & Co 9 Winter St CLEVELAND

SILVER & DEMING MFG. CO.,

SALEM, OHIO, U. S. A.

MANUFACTURERS OF
Cistern, Pitcher, Well
and Force Pumps,
Wind Mill Pumps,
HAND AND POWER
ROTARY PUMPS,
Hydraulic Rams,
BOILER FEED PUMPS,
Garden Engines, &c.

Also, Carriage Makers' Tools,
Blacksmiths' Drills, Butchers'
Tools, and Feed Cutters.

Write for Catalogue and Prices.

EUROPEAN AGENCY WITH
SELIG, SONNENTHAL & CO.,
London, E. C., England.

GIES & CO.
LITHOGRAPHERS
AND
PRINTERS
POSTERS
SHOW CARDS
CIRCULARS
BUFFALO, N. Y.
TYPE PAVERS
& CATALOGUES
SPECIALTY
BLANK BOOKS MADE TO ORDER.
WOOD ENGRAVING AND ELECTROTYPING

JOHN MAXWELL.

Manufacturer of
Patented
BRASS, BRIGHT
TINNED WIRE
& JAPANESE

Bird Cages.

The cheapest and most
reliable in market.
Catalogues and Price
Lists furnished to the
trade.
247 & 249 Pearl St.,
New York.



Full size of Band for Brass and Tinned Wire Cages.

**DUNBAR BROS.,**

Manufacturers of

Clock Springs and Small Springs
of every description, from 1/2 Cent Steel,
BRISTOL, CONN.

**DETROIT BLOCK
WORKS,**

Detroit, Mich.,
MANUFACTURERS OF
EVERY VARIETY OF

Tackle Blocks

AGENTS:
GRAHAM & HAINES, New York,
CHAMBERLAIN, COX & MILLER,
Chicago.
ST. LOUIS RY SUPPLIES MFG
CO., St. Louis.

BUFFALO SCALE CO.,

BUFFALO, N. Y.

Manufacturers of
R. R. Track Scales, Hay Scales, Coal
Scales, Grain Scales, Platform
Scales, Counter Scales, &c.
Send for price list, stating what you want.

Gendron Iron Wheel Co.

TOLEDO, OHIO,
Manufacturers of

IRON AND STEEL WHEELS.
All sizes and descriptions of
Iron and Steel Wheels for
Hay Rakes, Cultivators,
Wheelbarrows, &c.

Also Steel Wheels with Rubber
Tires for Children's Car-
riages, Velocipedes, Bicycles, &c.
Write for Prices.

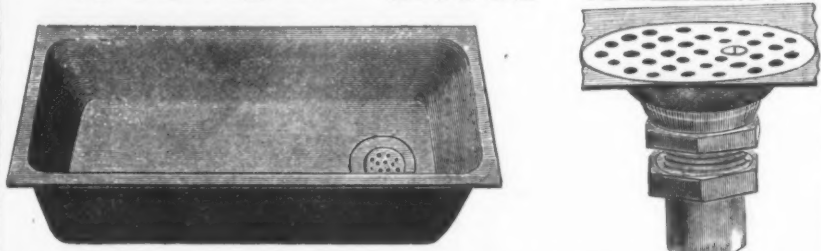
NEW MAKE OF MINE LAMP.
THREE DIFFERENT
SIZES
SEND
15 CENTS
FOR SAMPLE
TO
LEONARD BROS., Scranton, Pa.

HAMMER HANDLES.

Hammer and Hatchet Handles for
Tool Makers.

S. MUSSELMAN & SON,
QUAKERTOWN, PA., U. S. A.

W. & B. DOUGLAS,
MIDDLETOWN, CONN.,
The Oldest and Most Extensive Manufacturers of
PUMPS, HYDRAULIC RAMS, GARDEN ENGINES,
Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill
Pumps and other Hydraulic Machines in the World.

**Wrought Steel Sinks.**

One of the strong points of these sinks is the new coupling with which they are now supplied and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent, is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

BRANCH WAREHOUSES:

85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

UNION MANUFACTURING CO.,

Manufacturers of all Styles

PLAIN AND ORNAMENTAL BUTTS,

LOOSE PIN REVERSIBLE, CAST FAST AND LOOSE,
Drilled and Wire Jointed, Japanned, Figured Enam-
eled, Nickel Plated and Real Bronze Butts.
Also a full line of

IRON AND BRASS PUMPS,

Cistern, Well and Force Pumps, Yard Drive Well,
Garden Engine and Steam Boiler Pumps, Hydraulic
Rams, &c., and all with the most modern improvements.

UNION SPIRAL SPRING HINGES.

We beg to call the attention of Architects, Builders, Dealers, and all interested parties, to our Spiral Spring Hinge, knowing it to be an effectual and durable one, best in appearance, easy to put on, and not liable to get out of order. The Springs are made from wire made expressly for us and for this particular purpose, with the view of great elasticity, durability and power. They produce a continuous pressure from the point where the door is wide open until it is closed, and then hold it perfectly in position. It has a solid pin in connection with short hollow ones, causing little or no friction, the whole power of the spring being exerted in swinging the door. It is Fast Joint, and can be used for either right or left hand, allowing the dealer to carry less stock, and the builder will never get the wrong hand.

BE THE FINE CASTING A SPECIALTY.

NEW BRITAIN, - - CONN.

Warehouse: 96 Chambers St., NEW YORK.

Illustrated Catalogue and Price List furnished upon application.

OLD DOMINION
CUT NAILS, BAR IRON.

Address **R. E. BLANKENSHIP**

RICHMOND, VA.

THE E. & C. BROOKE IRON CO.,

Birdsboro, Berks Co., Pa.,

Manufacturers of

ANCHOR BRAND
NAILS AND SPIKES.

Capacity 1000 Kegs per Day.

Made from their own Pig Iron, insuring regularity and superiority in quality.

Also, FOUNDRY AND FORGE
PIG IRON,
And Cold Blast Charcoal Car Wheel Iron.

IRON AND STEEL DROP FORGINGS

All shapes, small and large, including
GUN, PISTOL, WRENCH BARS, &c. ALSO, DIE SINKING. MANUFACTURERS ALSO
OF BRICKLAYERS' MOULDERS' AND PLASTERERS' TOOLS,
SADDLERS' ROUND AND HEAD KNIVES.

WILLIAM ROSE & BROS.,

36th & Filbert Sts., WEST PHILADELPHIA.

NATIONAL HARDWARE & MALLEABLE IRON WORKS,

Lehigh Avenue, American and Third Streets, Philadelphia.

THOMAS DEVLIN & CO.,

MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS made from patterns to
order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line
of Carriage and Wagon Castings constantly on hand for the trade.

BRIDGEWATER IRON CO., Bridgewater, Mass.

Manufacturers of

SEAMLESS DRAWN BRASS & COPPER TUBES,
CUT NAILS, HORSE NAILS, FORGINGS, &c.

NAHUM STETSON Jr., Agent, 73 Pearl Street, New York.

placed upon a bed, and there successively subjected on one side to the action of superheated steam, chilled and cleaned. The sheets are then turned over on to an adjoining and similar bed, and the other side of the sheet is similarly treated. The pipe that furnishes the superheated steam is equal in length to the breadth of the sheets, and is provided with fan-tailed nozzles that distribute and direct the steam in broad, thin and uniform layers over the sheets.

Scissors with a soft metal handle cast upon an extension or shank of the blade have been improved by J. D. Frary, of Bridgeport, Conn. The shank has an offset from the plane of the blade, projecting beyond the flat surface. The blade and shank are placed in a mold, and the soft metal is cast around the shank and its shoulder, thus serving to support the shoulder upon which the blades strike. By this construction the connection between the handles and blades is strengthened, and a better support to the shoulder is given.

A guard to be slipped upon barbed-wire fencing at certain intervals, so as to render the fence visible to animals, has been patented by R. Boone, of Philadelphia, Pa. The guard consists of a small wooden block of suitable form, and having a slot extending from its periphery to its center. The block is strung or passed over the wire until the latter rests within the end of the slot. In this position a key made of a flat, tin strip is slipped into a narrow cross-slot, and holds the guard upon the strand. The ends of the key are bent downward against the faces of the guard to prevent accidental displacement of the key.

A metallic street paving block patented by J. M. Glenn, of Cincinnati, Ohio, consists of a cast-iron box or shell, open at the bottom. Its exterior surface may be roughened to furnish foothold. Into the shell is first placed a strip of an elastic material such as pine or felt. The remainder of the shell is filled up to its lower edge with concrete, artificial stone, gravel or similar material. This is allowed to harden under pressure. The advantage of these blocks lies principally in the fact that they can be cast to exact dimensions and outline. Thus curb-stone blocks may be cast with concave tops, and blocks adjoining the rails of a horse-railroad may be made with beveled edges. These blocks will also, it is claimed, wear better than granite, and can be had cheaper than granite in the West and South.

A snow shovel in which a worn blade may be removed and replaced by a new one has been patented by H. J. Welch, of Carthage, N. Y. The blade, made of metal or wood, has a central screw hole, through which a pin or nut is passed to fasten the handle. The handle is inclined, and has, at a short distance above its connection with the blade, a head-block, which is attached to the blade by a pair of angle irons grasping over the edges. Thus the handle is securely held in place, but may be removed by unscrewing the nut and pulling the blade out from between the angle irons. The blade of the shovel is made symmetrical, so that when one edge is worn out it may be reversed.

An apparatus for removing the scales from nails and tacks after tinning is the invention of H. B. Chess, of Pittsburgh, Pa. The tacks fall within a chamber, upon a series of inclined planes, which leads them to a vibrating chute. Opposite the chute an air blast issues through a fan-shaped nozzle. The tacks move down the inclination of the chute, while the scales are blown into a chamber in the rear of the apparatus.

A new carpet-fastener has been patented by J. A. Markoe, of St. Paul, Minn. It consists essentially of a pin driven into the floor next to the wall. To the head of the pin is pivoted a gripping jaw with a corrugated lower edge. The gripping jaw is first turned upward, and after the carpet is in position it is swung down so as to clamp and hold it.

J. S. Griffin, of Cleveland, Ohio, has patented a machine for drawing iron and steel bars for heavy shafting in one continuous operation. The bars are first cut to the proper length, and the ends are heated and reduced a sufficient length from the shoulder to the head to allow the thickest part of the bar to be drawn clear through the dies. The head is formed to fit into a recess of a sliding carriage, in which it is locked. The carriage is then moved, and will draw the bar through the die. A left-hand chain then draws the bar through a left-hand die, and again decreases its diameter. If desired, two bars can be drawn at the same time. The machine needs only to be started, and when it has drawn the bar through a die it is stopped automatically.

Ice tongs of a new form have been patented by W. Dimond, of Huntington, Ind. Only a single handle is employed, which is used in connection with a slide into which one finger is inserted to operate the grappling hooks. These tongs are claimed to be more convenient than those now commonly used, for besides dispensing with the double handle, they hold the ice in a line vertically beneath the handle.

One of our English exchanges, the *Mechanical World*, gives an amusing account of the way in which some inventors are piling up prospective costs for lawyers and trouble for themselves. Taking advantage of the new British Patent act, it appears that many would-be patentees are drawing and filing their own specifications, while others are availing themselves of the offers of cheap patent agents, the result in either case being about the same. Having as a guide only the official journal in which the names of the applicants, their addresses and callings, and the titles of the inventions are given, it would seem that some inventors have no Christian names, while others have strange residences, the titles given to the inventions, however, being the main points of interest. Thus our contemporary remarks that "Snooks, who fancies he is going to startle the world with his wonderful new carpet tack, and is far too clever to need any assistance, plunges ahead and dubs his invention 'carpet tacks,' to be called Snooks' invincible carpet tacks." Then there is Styles,

who is 'above making improvements in anything. He has launched a specification for 'construction of steam boilers,' as if no one had ever constructed a steam boiler before him. The same day Diggle applies for a patent for 'propelling vehicles by silent continuous motion,' and Smith applies for a 'patent for heating flat-irons.' These few instances speak for themselves, illustrating the care required in making out specifications, and the errors that are likely to be made by inexperienced persons.

A Railway Through the Sahara.

In a lecture delivered to the Lower Rhenish Architects' and Engineers' Association, Herr Jüttner lately gave some interesting particulars on French railway projects for the northwest of Africa. The Sahara Railway is intended to connect Algiers with Timbuctoo, but the obstacles in the way of its successful accomplishment are serious, the construction of these 1700 miles of railway being impeded by the climate, the scarcity of water, the dangers arising from sandstorms and the hostility of the natives. The temperature of the Sahara is especially trying from the fact that the nights are extremely cold. For the purpose of supplying water an extensive system of water-pipes is spoken of, which would cost \$8000 a mile; but it is also remarked that there are in the Sahara underground watercourses, which, coming into view at certain spots, form oases. It is therefore argued that artesian borings would probably be successful, so that the pipe communication alluded to could probably be confined to various points. The only detailed plans in existence regarding the Sahara line are those which affect the portion in Algeria—about 250 miles in length. Of the remaining 1450 miles, about one-half would seem to have been roughly planned on the information of travelers, while the projects for the remainder of the line are of a vague character, being founded on unreliable information. The cost is estimated at \$80,000,000, and the whole scheme is based on the material assistance of the French Government in its execution. The calculations of profit are partly founded upon the gain to be derived from the importation of salt into the Soudan, where it is worth from 18 to 25 cents per pound. The company working the line would have a monopoly for the sale of salt, and a revenue of \$2,000,000 is looked for from this source. The import of various necessities and the export of products of the Soudan are relied upon to supplement this return in an important degree, the rates being based on charges of 3 cents per ton per mile for most classes of goods, and 1½ cents per passenger per mile.

French Mineral Statistics for 1883.

Statistics of the iron industry in France show that production of pig iron in the past year was 1,019,259 tons, against 1,048,128 tons in 1882, or a decrease of 28,869. The table for the production of the different classes in 1883, as compared with 1882, is:

	1882	1883	Total
	Tons.	Tons.	Tons.
Forge	1,537,518	402,484	1,940,002
Foundry	42,566	12,568	55,134
Coke	17,636	25,296	42,932
Total	1,597,749	441,318	2,039,067

The production of iron rails, merchant iron and plates for the two years, is:

	1882	1883	Decrease
	Tons.	Tons.	Tons.
Rails	27,016	19,738	7,278
Merchant iron	882,840	800,840	82,000
Plates	163,165	148,510	14,655
Total	1,073,021	969,088	103,933

Statistics of the steel production for the two years are:

	1882	1883	Total
	Tons.	Tons.	Tons.
Merchant	13,034	1,821	14,855
Rails	28,555	13,034	41,589
Bessemer	71,704	63,336	135,040
Siemens-Martin	13,535	723	14,258
Puddled	2,703	2,703	5,406
Cement	7,555	296	7,851
Crucible	286	50	336
Remelted	1,199	175	1,374
Total	180,259	100,549	280,808

The output of coal, including anthracite and lignite, was 21,446,199 tons, an increase of 842,495 tons in 1882.

Basic Steel for Shipbuilding.—A series of experiments have recently been made in England by Lloyd's Register Committee as to the suitability of basic steel for ship construction, the angles and plates tested being rolled from material furnished by the North-eastern Steel Company. Mr. W. Parker and Mr. H. Cornish, who conducted the experiments, subjected the material to tensile tests, hot and cold bending tests, and temper tests. Further, they took some of the angles to a neighboring shipbuilding yard, heated them, bent, leveled and subjected them to the same treatment that a ship's frame would undergo in the ordinary course of shipbuilding. As the result of these experiments, they have reported to the committee of Lloyd's that, so far as the requirements of Lloyd's register is concerned, steel made by the basic process is equal to steel produced by the acid or hematite processes. In accordance with these recommendations, the committee have now informed the North-eastern Steel Company that such metal may be used for ships built under the inspection of their surveyors, to class in their society, subject, of course, to the usual tests applied to steel plates and angles.

Paris, 1878. **McCAFFREY & BRO.,** For Superiority.
PENNSYLVANIA FILE WORKS
Philadelphia, Pa., U. S.

Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

DETROIT FILE WORKS,
DETROIT, MICH.

MANUFACTURERS OF **FILES & RASPS** The Largest Hand File Works in the U. S.

Proprietors: **ROWE & HAYES,** Detroit, Mich.

GRAHAM & HAINES,
113 Chambers Street, NEW YORK,

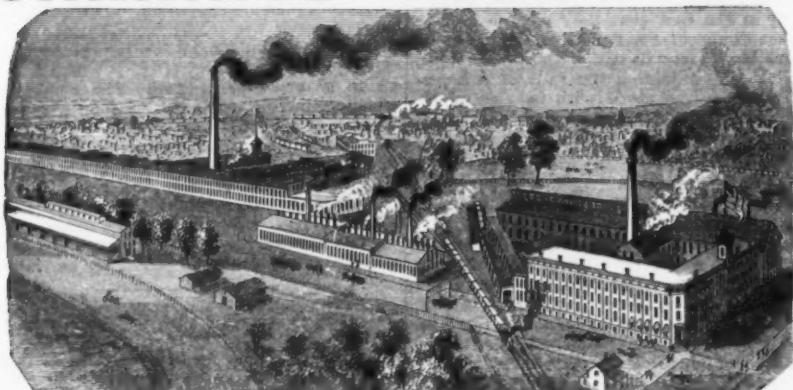
AGENTS FOR

SEYMOUR SMITH & SON,

MANUFACTURERS OF

PRUNING SHEARS, ROCKDALE PRUNER, CLIPPERS, &c.

CARRIAGE HARDWARE.



THE E. D. CLAPP MFG. CO., Auburn, N. Y.

LIGHTNING HAY KNIVES.

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for exports as well as home trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.

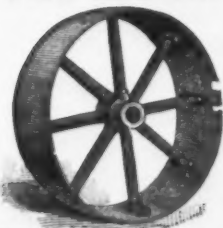
MANUFACTURED ONLY BY

HIRAM HOLT & CO.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

The Medart Patent Wrought Rim Pulley



THE LIGHTEST, STRONGEST, BEST BALANCED, AND CHEAPEST IN THE WORLD.

Whole Pulleys, from 6 inches to 120 inches diameter. Split Pulleys, from 12 inches to 120 inches diameter. All widths of face up to 36 inches, crowning or straight, with single, double or triple sets of arms; also tight and loose pulleys.

Absolute Satisfaction Guaranteed.

SEND FOR PRICE LIST.

MEDART PAT. PULLEY CO., 1206 to 1214 St. Louis, Mo.



Cleveland Iron Ore Paint Co.,

MANUFACTURERS OF

PURE IRON ORE PAINTS.

Red (Rosette), Purple and Brown. We guarantee all our paints, and respectfully solicit the patronage of consumers and dealers. Our paints are used largely by the railroads and car builders of our country. Send for Price List No. 15.

OFFICE: 154 MERWIN ST., CLEVELAND, O.

**BEST
IRON
PAINT.**

LINING NAILS & BUTTONS.

Swedes Iron Upholsters' Gimp, Lace and Card Tacks, Black and Tinned Trunk and Clout Nails, Finishing Nails and Brads; Shoe Nails of Swedes and Common Iron; Copper, Brass and Steel Lining and Saddle Nails; Tufting Nails and Tufting Buttons; Brass and Iron Wire Nails, Molding Nails, Escutcheon Pins, Black and Galvanized Regular and Chisel-Pointed Boat Nails.

New York Salesroom, 116 Chambers Street.

AMERICAN TACK CO., Fairhaven, Mass.

Nicholson FILES.

Bandsaw Files,
Boot Heel,
Brass,
Cabinet,
Cant,
Cotter Taper,
Cotter Equaling,
Cross or Crossing,
Doctor,
Drill,
Feather Edge,
Finishing,
Flat,
Flat Equaling,
Flat Wood,
Gang-Edger,
Ginsaw,
Gulleting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single-cut,
Handsaw Taper, double-cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
Square Equaling Files,
Stave Saw,
Three-Square Files,
Three-Square Blunt Files,
Tumbler Files,
Union Cut,
Warding Files,
Warding Blunt File,
Warding Round Edge File.

RASPS.

Baker's,
Beveled Edge,
Broad,
Cabinet,
File, Flat and Half-Round,
Flat Shoe,
Flat Wood,
Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged,
Horse Mouth,
Jig,
Oval or French Shoe,
Racer, Plain and Tanged.

SPECIALTIES.

Butchers' Steels, Improved,
Bent Rifflers, Handled,
File Cards,
File Brushes,
Machinists' Scrapers,
Stub Files & Holder, Detachable,
Surface File Holder,
Vise File Holder.

**NICHOLSON
FILE CO.,**
PROVIDENCE,
R. I.,
SOLE MANUFACTURERS.

BLACK DIAMOND FILE WORKS.



TRADE MARK.



G. & H. Barnett, 21 to 43 Richmond St., Philadelphia.

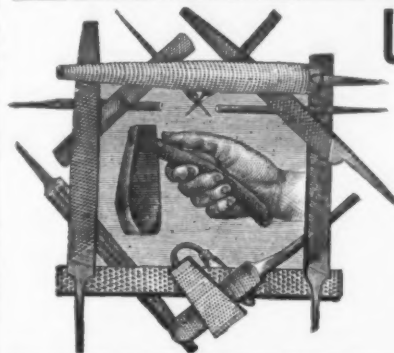
CHARLES B. PAUL,
Manufacturer of HAND CUT FILES.

Warranted CAST STEEL.

All descriptions of Files made to order. Price List mailed on application.

157 Tenth Street, Williamsburgh, New York.

Established 1863.



UNION FILE WORKS

311 to 315 North St.,

BALTIMORE, MD.,

Manufacturers of

FILES AND RASPS

Made from the Best Refined Cast Steel.

With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction.

MORITZ & KEIDEL, Agents,
48 & 50 German St., Baltimore, Md.

THRIFT FILE WORKS,
Manufacturers of all kinds of
Files, Rasps.



CHRISTIAN HENSSLER,
498, 499, 500 & 501 Ireland St., PHILA., PA.
HERRING & SWEENEY, Agents in New York, 102 Chambers St.

CUN POWDER.

Laflin & Rand Powder Co.,

No. 29 Murray Street, New York,

Manufacture and sell the following celebrated brands of Sporting Powder known everywhere as

ORANGE LIGHTNING,

ORANGE DUCKING,

ORANGE RIFLE,

more popular than any Powder now in use.

Blasting Powder and Electrical Blasting Apparatus.

Military Powder on hand and made to order.

SAFETY FUSE, FRICTIONAL & PLATINUM FUSES.

Pamphlets showing sizes of grain sent free.

The Patent Combined

Dinner Pall and

Lantern.

The most perfect Dinner Pall in the world. Hot coffee for dinner and a Lantern at night.

Manufactured by **JOS. HAIGHT,**

PORT CHESTER, N. Y.

Sent by express on receipt of \$1.00. Agents wanted.

HELLER & BROS., Newark, N. J.,

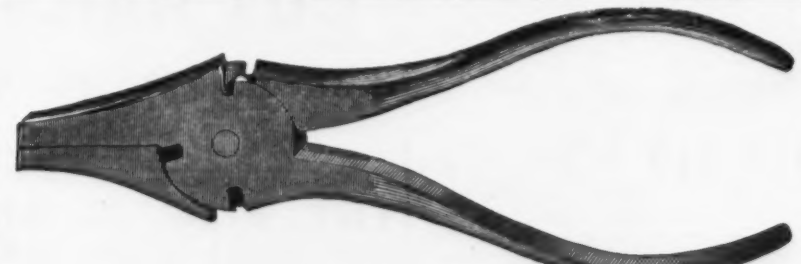
Manufacturers of the

Celebrated American

HORSE RASPS AND FILES,



Made of the best American Steel, and warranted to be unequalled in the market. For sale by Iron and Hardware dealers throughout the United States and Canada.



J. M. KING & CO.
WATERFORD, N. Y.,

Manufacturers of the **BUTTONS PATENT**

"WIRE CUTTER AND PLIER COMBINED,"

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps

Hand, Nut and Screw Taps, Pipe Taps and Reamers.

Established by **DANIEL B. KING,** 1869.

LIGGETT SPRING AND AXLE CO.

LIMITED, MANUFACTURERS OF

SPRINGS AND AXLES

For Coaches, Phaetons, Buggies, Wagons, &c.

Pittsburgh, Pa.

T. H. BULLOCK,

BELLOWS AND FORGE

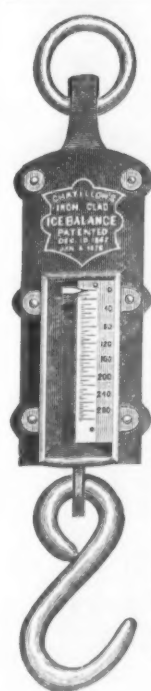
Manufacturer,

85 & 87 Columbus St.

CLEVELAND,

OHIO.





IRON-CLAD ICE BALANCE.

JOHN CHATILLON & SONS,
NEW YORK,
91 & 93 Cliff Street,
MANUFACTURERS OF
Spring Balances, Patent Balances, Union and
Counter Scales, Spiral Springs.
Send for Illustrated Price List.

THE Greenfield Vertical Engine



is unequalled by any
other in workmanship
and quality of material.
2½ to 30 horse-power.
Prices lower than any
other first-class engine.

COOKE & CO.,
DEALERS IN
MACHINERY
AND
SUPPLIES,
22 Cortlandt St.,
NEW YORK.

In writing, please mention this paper.

THE OLD RELIABLE Bissell Carpet Sweeper.

THE PIONEER OF THE SWEEPERS.



The Latest Improvement—No. 7, with Drop Pan.
Its mechanical simplicity makes it the favorite
with all who have been perplexed by the com-
plicated contrivances of other sweepers.

BISSELL CARPET SWEEPER CO.,
46 Murray Street, New York.
T. W. WILLIAMS, Eastern Manager.
SEND FOR NEW CIRCULAR.

WILLIAMSPORT SAW WORKS. SELF-STRAINING. BEST AND CHEAPEST.



P. W. Gallaudet
& Co.

Cor. Broadway and Wall St., New York.
Bankers and dealers in COMMERCIAL PAPER.
Stocks and Bonds dealt in for cash or on margin at
New York Stock Exchange.

GEORGE W. BRUCE,
1 Platt St., New York, Proprietor of the
ATLANTIC SCREW WORKS,
Agent for the



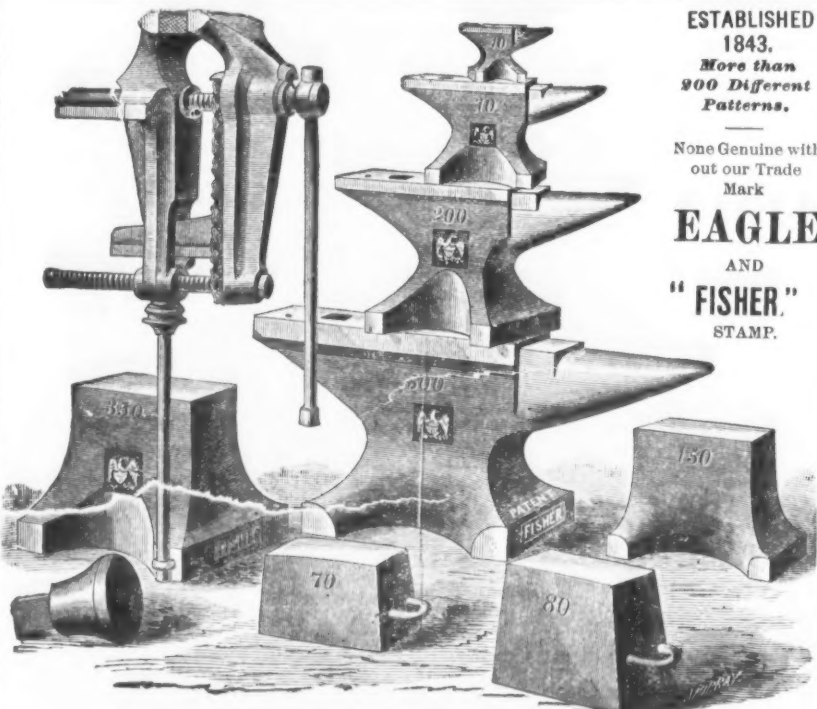
Florence Tack Co. and
C. A. Maynard,

MAYNARD'S C. S. Planters',
Hilling, Bog and Handled
Planters, Cotton and Field
Hoes.
BRADY'S Crown, Planters'
and Hilling.
ELWELL'S Weeding, Plant-
ers' and Grub, and a variety
of other kinds for Home
and Export Trade.

ESTERBROOK'S STEEL
PENS

Leading Numbers: 14, 048, 130, 333, 161.
For Sale by all Stationers.

THE ESTERBROOK STEEL PEN CO.
Works, Camden, N. J. 26 John St., New York.



ESTABLISHED
1843.
More than
200 Different
Patterns.

None Genuine with
out our Trade
Mark
EAGLE
AND
"FISHER"
STAMP.

WARRANTED BETTER THAN THE BEST ENGLISH ANVIL!

Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of
hardest temper and never come off or "settle." Horn of tough untempered steel, never to break or
bend. Only Anvil made in United States fully warranted as above.

FISHER DOUBLE-SCREW VISE

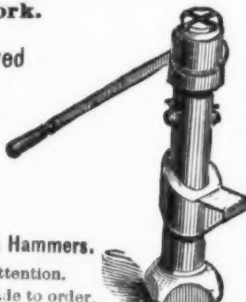
IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL.
Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND
DURABLE. Send for Circular.

EAGLE ANVIL WORKS, Trenton, N. J.

RICHARD DUDGEON,

No. 24 Columbia Street, New York.

Maker and Patentee of the Improved
Hydraulic Jacks
AND
Punches.



Roller Tube Expanders and Direct Acting Steam Hammers.
Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order.

ANSONIA BRASS AND COPPER CO., PURE ELECTRIC WIRE,

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Splittorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Call Bells, Bell Patches, Steamboat and
Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

THE ESSEX HORSE NAIL CO., Limited.

OFFICES: ESSEX, ESSEX CO., NEW YORK.
100 CHAMBERS STREET, NEW YORK CITY.

THE ESSEX HORSE NAILS

Are drawn from the Best Norway Iron Rods only. They are hot forged and cold-
pointed, rendering them both tough and stiff, and are warranted

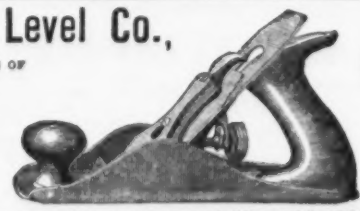
FIRST-CLASS IN EVERY RESPECT.

By the use of improved machines we forge Fifty per cent. More Nails on a machine
than any other company, and are thus enabled to sell them proportionately less than any
other nail of equal quality. All nails branded ESSEX fully guaranteed.

Stanley Rule & Level Co.,

MANUFACTURERS OF

Improved
Carpenters'
Tools.



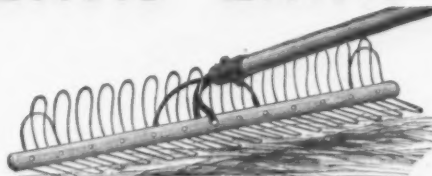
FACTORIES,
New Britain, Conn.

WAREHOUSES,
29 Chambers St.,
New York.

Manufacturers of Bailey's Patent Adjustable Planes.
General Agents for the sale of Leonard Bailey & Co.'s "Victor Planes."
Manufacturers of "DeLancey" Patent Adjustable Planes.

THE DAVIS LAWN RAKE.

A
PERFECT
RAKE



FOR
CLEANING
LAWNS.

PATENTED DECEMBER 17, 1878.

The teeth are so formed as to make it impossible to tear the grass or injure the lawns in any man-
ner. As a stable or general-purpose rake it is unequalled. No implement made so completely fills the
immense demand for a lawn cleaner. For sale by Jobbing, Hardware, Implement and Seed Houses
throughout the United States, England and Germany.

W. A. HALTEMAN & CO., Mfrs., Dayton, Ohio, U. S. A.

MANUFACTURERS OF

GENUINE BRONZE, BRASS, AMERICAN BRONZED AND JAPANNED HARDWARE,

Rim and Mortise Locks, Knobs and Escutcheons,

Apple Parers, Registers, Bronze and Cast Butts,

STATIONERS' HARDWARE, &c.,

READING HARDWARE CO., Reading, Pa.

Successful Business Enterprise.

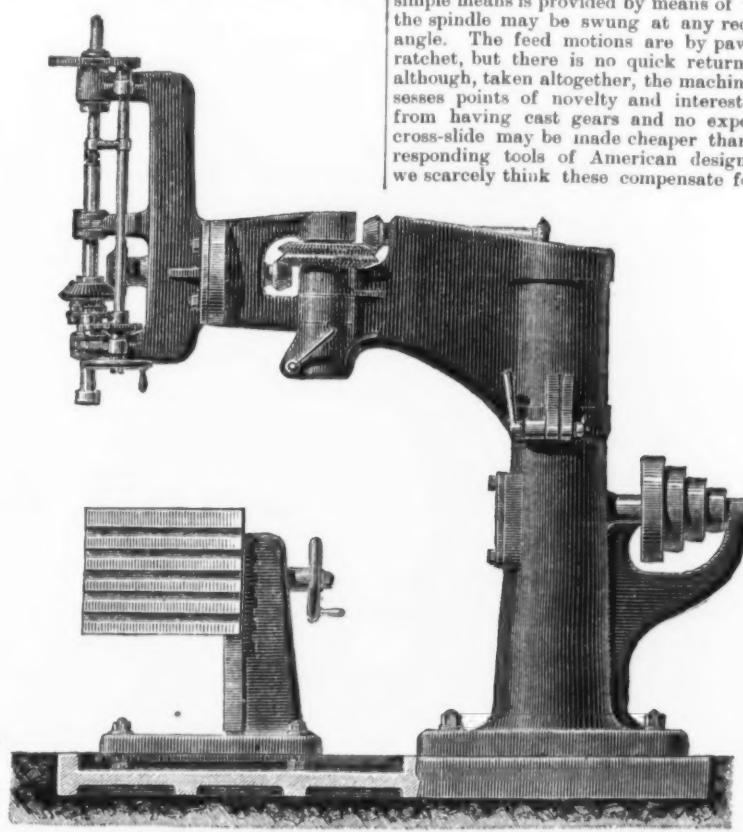
Some of the most successful business en-
terprises of the country owe their existence
to accidents or to circumstances which,
when considered in themselves, seem too
trivial to have produced such important re-
sults. It is narrated of the origin of one of
the most successful foundry-blowers now in
use that its inventor was attempting to con-
struct a water motor, and that when the
water was let on the machine refused to
turn. In the determination to learn what
was wrong he directed the affair to be
driven by belting from a line-shaft which
was available, so that its motion might be
studied. By the same means a reverse
motion was given it, and the way it threw
the water, and, after the water had been
exhausted, drove a current of air, suggested
an entire change of purpose, and the ma-
chine was finished as a blower instead of a
water motor, and thousands have been built
since. This story has often been told, with
various modifications of detail, and we
believe never successfully contradicted. It
serves as a good illustration of the fact, so
often noticed, that inventors frequently
stumble upon success in directions entirely
unexpected.

In large manufacturing enterprises, cir-
cumstances apparently unimportant in them-
selves frequently change the course of
business and introduce features that at the
outset were never contemplated. Some-
times they become very important and
practically eclipse the original business, and
in others they lead to the organization of
branch establishments. An instance in point,

tested in a practical manner, than it would
be possible to make them if their production
were not associated with their practical use.

A New Radial Drilling Machine.

The annexed engraving represents a new
radial drilling machine brought out by
Messrs. Challiot & Gratiot, of Paris, France.
The radial arms pivot upon the column, and
may be locked thereto by a clip joint. Mo-
tion from the driving cone is conveyed by
barb gears, plainly shown in the engraving.
The novelty of the machine consists in hav-
ing the live spindle and feeding mechanism
fixed at the end of the radial arm instead of
being carried on a sliding head, as is usual.
To enable the moving of the live spindle to
various positions about the work, a pivoted
joint is provided in the radial arm, and as a
result the whole adjustment of the spindle to
the work must be made by moving the
radial arm upon one or both of its pivots.
It may be pointed out that in moving the
live spindle the motion will be somewhat
easy if the pinion on the lower bevel gear
moves in the direction in which that gear is
driving it, but when the live spindle is
moved in the other direction it must be
done to a great extent against the friction of
the gears and the spindle bearings of the
outer half of the radial arm. This, ob-
viously, cannot be moved without revol-
ving the spindle to a corresponding extent,
whether the cone pulley is in action or not.
By bolting the spindle head to the end of the
radial arm, with bolts having T-heads in an
annular groove in the end of the radial arm,
a simple means is provided by means of which
the spindle may be swung at any required
angle. The feed motions are by pawl and
ratchet, but there is no quick return, and
although, taken altogether, the machine pos-
sesses points of novelty and interest, and
from having cast gears and no expensive
cross-slide may be made cheaper than cor-
responding tools of American design, yet
we scarcely think these compensate for the



NEW RADIAL DRILLING MACHINE.

and one that illustrates not only how small
causes may by proper attention lead to
very important results, but also how two
branches of business very unlike in char-
acter may be successfully combined and con-
ducted in one establishment, has recently
been brought to our notice. Comparatively
few of those who know the Long & Allstatter
Company, of Hamilton, Ohio, as builders of
heavy punching and shearing machines,
know them also as manufacturers of agri-
cultural implements. Yet these two branches
are conducted under the same roof, and in some
respects as though they were similar to each
other, or parts of one and the same line of
trade. A large and a small cupola in the
foundry make it possible to adapt the melt-
ing of iron to the character of the castings.
The large cupola is used when heavy cast-
ings are demanded, while the smaller one
proves quite sufficient when castings for
agricultural machinery are required. In
many other respects similar provisions are
made. The conduct of the business of this
company under what must be considered
somewhat difficult conditions, growing out
of the dissimilarities existing between plows
and power hammers, and between cultivators
and punches and shears weighing in some
instances as much as 30 tons, is very suc-
cessful, and the company enjoy a high re-
putation in both lines of trade.

The original business of the firm which
has since become known as the Long & All-
statter Company was the manufacture of agri-
cultural machinery, including knives and
other parts of reapers and mowers. In this
line of trade they were pioneers, and for many
years supplied various prominent makers.
In equipping their shop in a way to make
these goods in the best and most economical
manner, the want of a strong and efficient
punching press was experienced, and, after
fruitlessly searching for it, the firm deter-
mined to meet the requirements of the case
by building what would answer the purpose.
In this way the first machine of what has
since become a complete line of punching
and shearing machines was produced. The
success of this machine in the shops where
it was used soon became known to other
manufacturers, and thus the demand com-
menced. Various sizes were built for use
in shops making light machinery and im-
plements, and finally the attention of safe-
makers was drawn to them, which opened
up another channel of trade. Since that
date the machines have been largely sold to
railroad shops and to manufacturers of vari-
ous specialties. During all this time the
machines have been largely used in the shop
where they are made upon the class of goods
the proper manufacture of which led to their
invention. Undoubtedly the machines are
better suited to the purpose for which they
are intended, on account of being constantly

greater solidity and ease of adjustment of
the drill to the work possessed by machines
of American make.

The New Steamer Elder.

The new steamship Elder, the fourth fast
steamer of the North German Lloyd fleet,
arrived here on her first trip March 29.
She was built on the Clyde, in the shipyard
of Messrs. John Elder & Co., under the
supervision of Capt. Chr. Leist, and is under
command of Captain Willigerod. The Elder
is the sister ship of the Ems, now building.
Her length is 155 feet; breadth of beam, 47
feet; depth of hold, 37 feet; gross tonnage,
6000 tons, builders' measurement. She is
propelled by compound engines of the three-
cylinder type, which has two low-pressure
cylinders 88 inches diameter, and one high-
pressure cylinder of 64 inches diameter. The
stroke is 5 feet. Steam is supplied by double-
ended boilers of 15 feet diameter and 17.7
feet length. The engines have developed
7000 horse-power. At her trial trip a speed
of 18½ knots were obtained. As regards
equipment, the vessel is complete, being
provided with 300 electric lamps, electric
bells, bathing-rooms, steam windlasses,
steam and hand steering gear, steam pumps,
boats, life-boats, fresh-water condensers, and
all the recent appliances, insuring safety to
the vessel and comfort to those on board.
She is rigged with four pole masts of iron
with yards in the foremast. All in all, the
Elder is decidedly one of the finest
specimens of ocean steamships running at
the present day. Her sister ship, the Ems,
is now approaching completion in Glasgow,
and will make her first trip to this port in the
early part of June next. The Elder arrived
off the bar after a run of 8 days to hours ac-
tual time, equal to 7 days 15 hours from
Queenstown—a remarkable result, consider-
ing the heavy weather met with.

The old smelting furnace and forge near
Greenville, N. C., where the iron for the
barrels of the guns used in the war of 1812
was made, are still standing. The ore from
which this iron was made is slightly different
from that found in any other section of the
country, and is particularly suited for gun-
barrels and other articles to which toughness
and smoothness are prime requisites.

The Fitchburg Railroad Company have
placed a thermometer in each of their passen-
ger cars, in order that passengers may as-
certain the temperature of the car if they
wish to know. The New York Railroad
Commission suggested such an arrangement
to the railroad companies of this State in a
circular issued some months ago.

INFRINGEMENT OF JOHN WILSON'S TRADE MARK, MASSACHUSETTS, U.S.A.

JOHN WILSON'S
BUTCHERS' KNIVES,
BUTCHERS' STEELS,
and
SHOE KNIVES.
TRADE MARK



REGISTERED IN ENGLAND,
WASHINGTON, U.S.A.,
AUSTRALIAN & OTHER
BRITISH COLONIES, &
GERMANY.

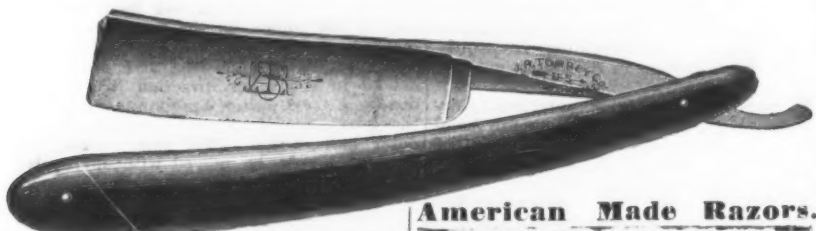
ACKNOWLEDGMENT AND AGREEMENT.
"WHEREAS, I, GEORGE A. ROBINSON, of West Mansfield, County of Bristol, State of Massachusetts, have heretofore manufactured and sold certain Knives bearing a Mark which is claimed to be an imitation of the trade-mark owned by John Wilson, of Sheffield, England, which consists of four peppercorns and a diamond, under the mistaken belief that I had the right to do so.
NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,
FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and
SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESSES:
E. M. REED,
(Attorney for Defendant.)

G. A. ROBINSON,
L.B.

JOHN WILSON
SHEAR STEEL
Mark

WORKS:—SYCAMORE ST. SHEFFIELD, ENGLAND. Established 1750.



J. R. TORREY,
Manufacturer of Razor Stroops & Dressing Cases.
Sole Agent for Worcester Cutlery Co.
Importer of Fine Razor Blades.

American Made Razors.
WARRANTED BEST CUTTERS IN THE WORLD.
J. R. TORREY RAZOR CO.
Factories: WORCESTER, MASS.
Send for Price Lists.

Our Razors are the STANDARD for excellent cutting quality and elegance of finish, and our prices are lower than any other makes of similar grade.

UNDERHILL, CLINCH & CO.,

94 Chambers Street, New York.

DEPOT FOR

Nicholson File Co.'s Files.

Russell Jennings' Auger Bits
Richardson Bros.' Saws
Geo. Selsor & Co.'s Hatchets, Hammers, &c.
American Screw Co.'s Wood, Machine and Rail
Screws, Stove and Tire Bolts, Rivets, &c.

Brady's Brick Trowels.
O. Ames & Son's Shovels, Spades and Scoops.
E. W. Gilmore & Co.'s Strap and T Hinges.
W. & S. Butcher's Edge Tools.
A. Field & Son's Tacks, Brads, Nails, &c.

GENERAL HARDWARE.

**DAME, STODDARD &
KENDALL,**

SUCCESSORS TO

BRADFORD & ANTHONY,

374 Washington Street, BOSTON,

Manufacturers, Importers and Dealers in

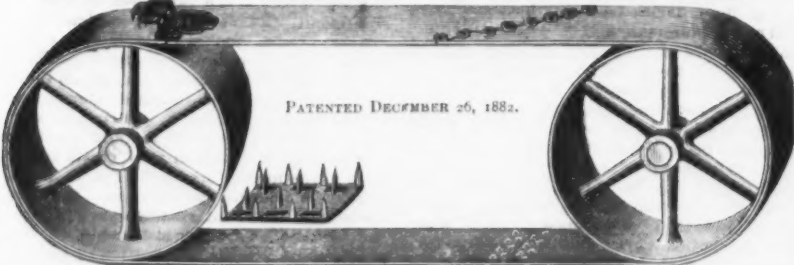
FISHING TACKLE,

CUTLERY,

FANCY HARDWARE,

ICE AND ROLLER SKATES.

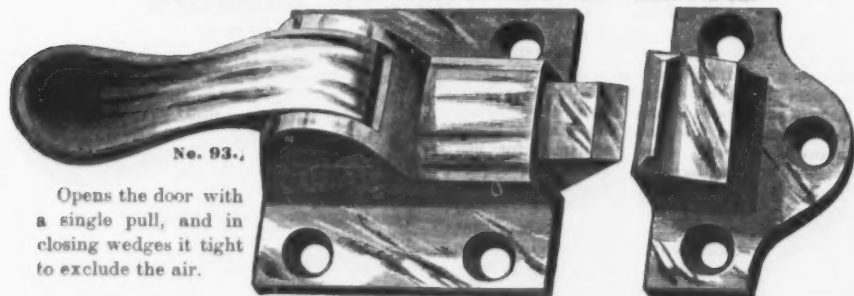
GIANT BELT FASTENER.



PATENTED DECEMBER 25, 1882.

L. A. SAYRE, Newark, N. J.

PAYSON'S REFRIGERATOR LATCH.



No. 93.

Opens the door with
a single pull, and in
closing wedges it tight
to exclude the air.

No. 90. Bronzed Iron, ornamental, per doz. \$6.00
" 91. Real Bronze, " " " 18.00
" 92. " " black inlaid, " " 18.00
No. 92. Real Bronze, plain, per doz. \$18.00
" 93. Nickel Plated on Brass, plain, " 22.00
(Discount 55 per cent.)

PAYSON MFG. CO.,
CHICAGO.

EASTERN BRANCH:
H. J. BRAINERD,
125 Chambers St., NEW YORK.

CORPORATE MARK.



Joseph Rodgers & Sons,
(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York

F. & W. CLATWORTHY, Agents,

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power. To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

ESTABLISHED 1836.

ALFRED FIELD & CO.,

93 Chambers and 75 Reade Streets,

NEW YORK,

SOLE AGENTS FOR

Ely Bros., Caps, Wads, &c.,
Joseph Elliot & Sons, Razors,
Isaac Greaves, Sheep Shears, &c.,
Robert Sorby & Sons, Sheep Shears, &c.,
Edward Elwell, Hoes, &c.,
R. & J. Linacre, Grass Hooks and Sickles,
Webster & Horsfall Steel Wire,
GENERAL AGENTS

Western File Co.'s American Files.

HEADQUARTERS FOR

**ANVILS CHAIN CUTLERY, GUNS
&c. &c. &c.**

A. F. BANNISTER & CO.

SUCCESSORS TO

FURNACE, BANNISTER & CO..

MANUFACTURERS OF

TABLE CUTLERY,
Cor. Nassau & Sheffield Sts., NEWARK, N. J.



WALDRON & SPROUT,

Manufacturers of

Sprout's Double and

Single Shear

Horse Hay Forks

And

Sprout's

HAY ELEVATORS,

PULLEYS and

GRAPPLES.

Send for Circulars.

Haver, Looming Co., Pa.

THE AMERICAN DYNAMO-ELECTRIC MACHINE,

FOR ELECTRO-PLATING,

ELECTROTYPING, &c.

Requires no

Water.

Combining all

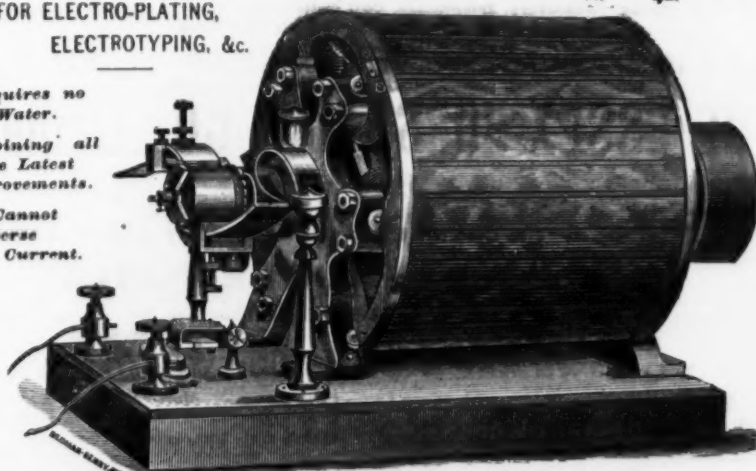
the Latest

Improvements.

Cannot

Reverse

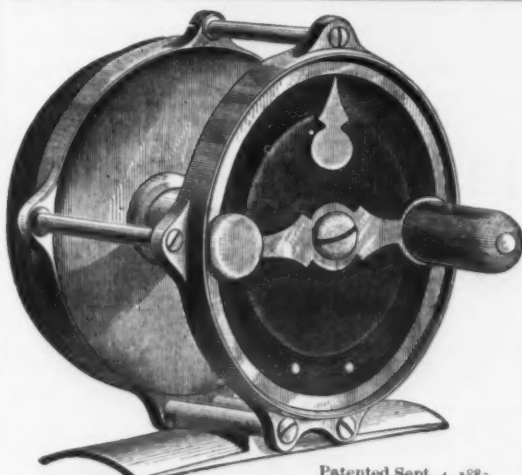
Current.



THE ZUCKER & LEVETT CHEMICAL CO., Sole M'rs.

Manufacturers and Importers of NICKEL PLATING SUPPLIES,

538 to 564 West 16th Street, NEW YORK.



PATENT PERFECTION

CENTRAL ACTION,

RAISED PILLAR

TREBLE

Multiplying Reel.

FLUSH BALANCE HANDLE

ADJUSTABLE CLICK.

Frederick Malleson,

Patentee and Manufacturer,

136 to 144 First St., Brooklyn, E. D., N. Y.

For sale by the trade generally.

Send for Illustrated Catalogue.

Rods, Reels, Hooks on Gut, Files, &c.

Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

and everything pertaining to a first-class plant of

Hoisting Machinery. Correspondence solicited.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral and Jet Knobs & Escutcheons.

Send for Price List and Terms.

OFFICE: 525 8th Ave., N. Y.



Charles Webster, Pres.

J. S. Lane, Supt.

S. M. Burnham Sec'y.

W. T. Allen, Treas.

Webster, Camp & Lane Machine Co.,

133 N. Main St., Akron, O.

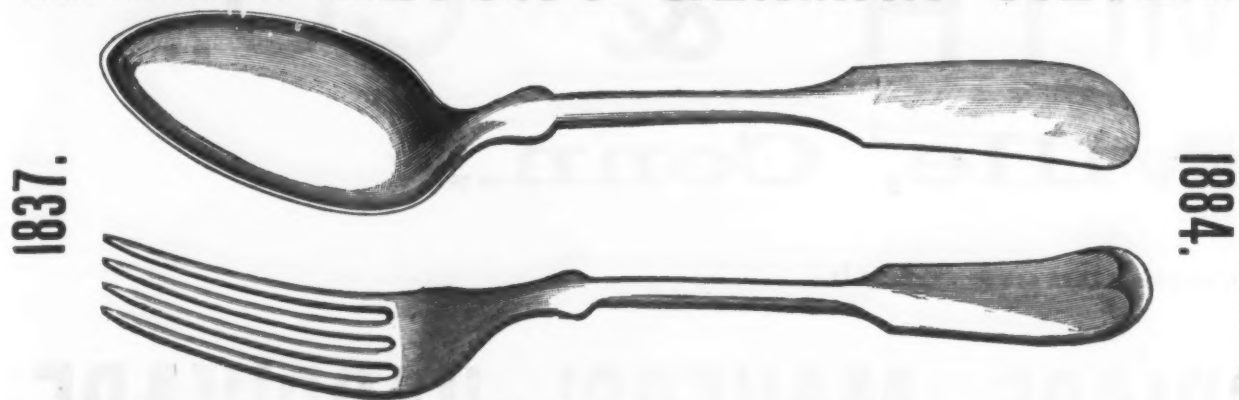
BAND FRICTION HOIST

For Mines and Blast Furnaces.

The SAFEST, SIMPLEST, STRONGEST and BEST

IN THE MARKET. Engines, Boilers, Pumps, Skips,

HALL & ELTON'S GERMAN SILVER.



In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

HALL, ELTON & CO. Wallingford, Conn., and 47 East 13th St., New York.

T. G. CONWAY CO., Limited,

(SUCCESSORS TO T. G. CONWAY.)

88 CHAMBERS STREET, NEW YORK,

AGENTS FOR THE

NORFOLK SHEAR CO., NORFOLK, CONN.,

Cast Steel Shears, Scissors and Trimmers.

Norfolk Brand equal to any. Connecticut Brand the best second grade Shear on the market. Send for Price Lists. Wholesale only.

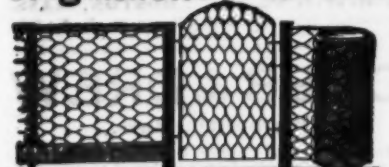
THE DELUSION MOUSE TRAP. "CHAMPION" CABINET LOCKS & PADLOCKS



The Mouse goes in to get the bait, And shuts the door by his own weight, And then he jumps right through a hole, thinks he's out; but, bless his soul; He's in a cage, somehow or other, And sets the trap to catch another.

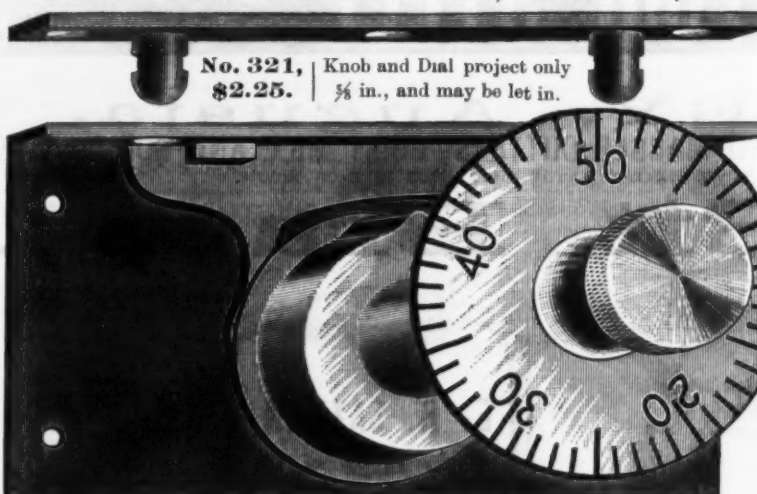
MANUFACTURED EXCLUSIVELY BY THE
LOVELL MFG. CO., LIMITED,
ERIE, PA.

Sedgwick Steel Wire Fence



Is the only general purpose Wire Fence in use, being a strong Net-Work Without Barbs. It will turn dogs, pigs, sheep, and poultry, as well as the most vicious stock, without injury to either fence or stock. It is just the fence for farms, gardens, stock ranges and railroads, and very neat for lawns, parks, school lots and cemeteries. Covered with rust-proof paint (or galvanized) it will last a lifetime. It is superior to Boards or Barbed Wire in every respect. We ask for it a fair trial, knowing it will wear itself into favor. The Sedgwick Gates, made of wrought-iron pipe and steel wire, defy all competition in neatness, strength and durability. We also make the best and cheapest All Iron Automatic or Self-Opening Gate, also Cheapest and Neatest All Iron Fence. Best Wire Stretcher and Post Auger. Also manufacture Russell's excellent Wind Engines for pumping water, or geared engines for grinding and other light work. For prices and particulars set hardware dealers, or address, mentioning paper, SEDGWICK BROS. M^{rs}, Richmond Ind.

MILLER LOCK CO., Philadelphia.



No. 321. Knob and Dial project only \$2.25. 3/4 in., and may be let in.

BAEDER, ADAMSON & CO.,
Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

(Also in Rolls, for machine work.)

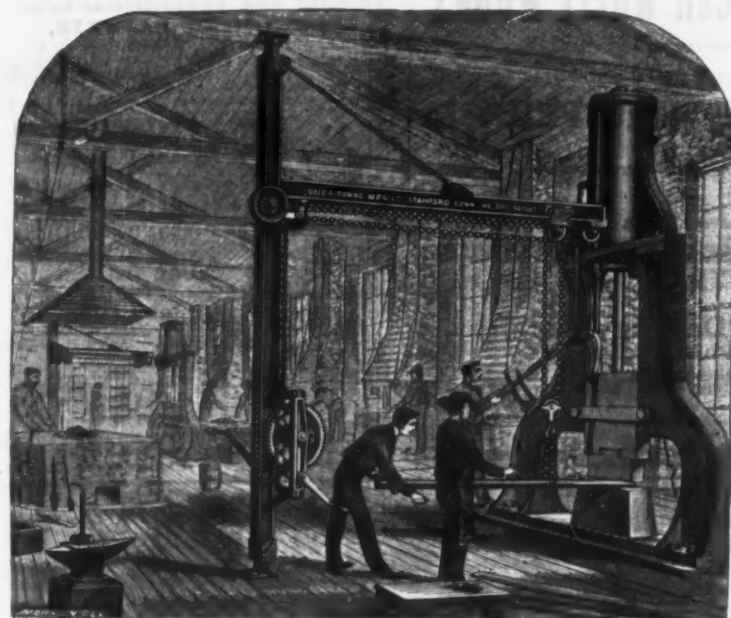
Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felt
Ing for Covering Boilers, Pipes, &c., Cow Hide Whips.
Stores: PHILADELPHIA, 730 Market St. BOSTON, 143 Milk St.
NEW YORK, 67 Beekman St. CHICAGO, 182 Lake St.

PENN LOCK WORKS



NICKEL-PLATED
Steel Key Blanks
OF EVERY DESCRIPTION.
G. W. NOCK,
142 N. Fourth Street,
PHILADELPHIA, PA.

WESTON'S PATENT SMITH'S CRANES.



SOLE MAKERS:

THE YALE & TOWNE MFG. CO.,

Manufacturers, Engineers and Machinists.

STAMFORD, CONNECTICUT.

NEW YORK: 62 BEADE STREET.
BOSTON: 324 FRANKLIN STREET.

PHILADELPHIA: 15 N. SIXTH STREET
CHICAGO: 64 LAKE STREET.

LATEST LEGAL DECISIONS.

PARTNERSHIP—STATUTE OF LIMITATIONS.

In the settlement of partnership accounts it was attempted to shut out the claim of one of the firm for money paid by him on behalf of the firm, on the ground that it was barred by the statute of limitations. In this case—Turner vs. Holloway—the Court of Appeals of Maryland decided that the claim should be allowed. Judge Bryan, in the opinion, said: "1. Partners have a lien on the partnership property for the payment of the partnership debts, and it is in consequence of this lien that the joint creditors are paid, and not by reason of any independent right which such creditors possess. Whether the firm is solvent or insolvent is not material; the rights of the partners do not depend upon that. It is only in subordination to this right of the partners that the claims of the creditors are permitted to be presented. 2. The plea of limitations cannot avail against a claim of one partner for money paid out for the firm. After an account is settled between the partners and a balance ascertained, a right to sue arises, and from that time the statute begins to run. But when a decree for an accounting between the partners has been made, all the claims existing between them arising out of the firm's affairs must be brought into the account for adjustment."

GUARANTY—SINGLE OR CONTINUING.

An action was brought upon an instrument as a continuing guaranty. It was as follows: "Boston, April 9, 1880. A. L. Cutler & Co. Gentlemen.—Please deliver to Charles A. Howland goods as he may want from time to time, not exceeding in amount \$300, and, if not paid within 30 days, I will be responsible for the same. B. R. Ballou" The Supreme Court of Massachusetts, in deciding the case—Cutler vs. Ballou—against the plaintiffs, said, through the Chief Justice (Morton): "In determining this question, but little can be derived from the decided cases, as each case turns upon the particular language of the guaranty to be construed. If the contract of the defendant had been that he would be responsible to the amount of \$300 for goods to be delivered from time to time to Howland, it would have been a continuing guaranty, because here is no limitation of the amount of goods to be sold or of the credit to be given, but the limitation is merely of the amount for which the guarantor will be at any time liable. Such a contract imports a succession of dealings in future without limit as to amount. But by the natural and grammatical construction of the guaranty in this case, the limitation, 'not exceeding in amount \$300,' applies to the goods to be delivered, and cannot fairly be construed merely as a limitation of the amount for which the guarantor would be responsible at any time or from time to time. The words 'from time to time' in the connection in which they are used in this guaranty import that all the goods to the amount of \$300 are not necessarily to be delivered at one time, but they do not enlarge the limit fixed in the contract of the goods to be sold and the credit to be given to Howland."

ATTACHMENT OF FUNDS IN HANDS OF EXECUTORS AND ADMINISTRATORS.

A creditor of a bank which had a judgment against an estate attached the amount due in the hands of the executors. The Supreme Court of Nevada, in deciding a suit—Norton vs. Haydon—brought to determine the validity of the attachment, through Judge Belknap said: "Where no order for distribution to creditors has been made, an executor or administrator is not answerable to the process of attachment. It would tend to distract and embarrass these officers if, in addition to the ordinary duties which the law imposes, of themselves often multiplied, arduous and responsible, they were drawn into conflicts created by the interposition of creditors of legacies, and compelled to withhold payment of legacies without suit; to suspend indefinitely the settlement of estates; to attend, perhaps, to numerous rival attachments; to answer interrogatories on oath, and to be put to trouble and expense for the benefit of third persons no way connected with the estate nor with the duties of their trust. It has been decided that money in the hands of a prothonotary or sheriff cannot be intercepted by a creditor of the party entitled to it, but it must be paid over to himself only. The case of an executor or administrator is analogous to that of a sheriff or prothonotary. He has the fund in his hands as an officer or trustee authorized by law, and if a new party were allowed to levy on it by attachment there would be no end of disputes and lawsuits, and no business could be certain of being brought to a close in a reasonable time. These funds must travel only the path pointed out by the laws relating to the decedents' estates in their various branches, and cannot be diverted out of that path without interfering with statutory regulations, and violating some of the most important provisions of the acts of assembly."

CHattel MORTGAGE—RIGHTS OF ASSIGNEE.

To a bill to foreclose a chattel mortgage a defense was made by the assignee for the benefit creditors of the mortgagee. He claimed that the mortgage was void as to him because it was not recorded in the county where it was made before the assignment to him was delivered. In this case—Shaw vs. Glen—the Court of Chancery of New Jersey gave the complainants a decree. The Chancellor, in the opinion, said: "The mortgage was clearly valid as against the mortgagee when he made the assignment, notwithstanding it had not been recorded according to law; and the assignee took his title to the property subject to the equities to which it was subject in the hands of his assignor. Such is the rule as to the assignees in bankruptcy; he is not bound by the fraudulent conveyances of his assignor, but in cases unaffected by fraud he is bound by the equities to which the property assigned was liable when it came to his hands from his assignor."

TRADE-MARK—MISREPRESENTATION.

An extract of malt was made by one Gessner for R, from a formula prepared by himself, but R in putting it up for sale used upon the bottles containing it, and in the advertising pamphlets describing its value, the word "Trommer," and also the words

"Extract of Malt Co." as a trade-mark. Gessner began his work in 1874, but long before that time N, a German physician of reputation, in a medical text-book which was published in the United States in 1870, stated that in late years he had obtained very good effects from an extract of malt prepared by Trommer, and in Ziemssen's "Cyclopedia of the Practice of Medicine," Trommer's receipt is noticed. Gessner did not know of Trommer's receipt, and it is not claimed that the malt extract of R was prepared with Trommer's method, but he used the name of Trommer as a trade-mark. B also made and sold a malt extract and put the name of "Trommer" on the bottles containing it, and R sued to enjoin him from using the name as a violation of his trade-mark. In this suit R got an injunction, and B carried the case, in error—Buckland vs. Rice—to the Supreme Court Commission of Ohio, where the judgment was reversed. Judge Nash, in the opinion, said: "Why was the name of Gessner, the real author of the extract, concealed and 'Trommer' put forward as the catch-word? There could have been but one motive, and that was that the public should be led to believe that R was making an extract of malt like that made by Trommer, and mentioned by N and by Ziemssen. It is settled that where any symbol or label claimed as a trade-mark is so constructed or worked as to make or contain a distinct assertion which is untrue, a court of equity will not protect it by injunction. We think that the labels and trade-mark which R claims the exclusive right to use were so constructed as to hold out to the public that they manufactured malt extract like that made by Trommer. This was not true."

PARTNERSHIP—POWER OF MAJORITY OF FIRM.

Five persons agreed to cut and pack ice for sale, and after all expenses were deducted to divide the proceeds equally. Three months later one of the associates sold all of the ice for \$1.25 a ton after consulting two others whom only he could reach in time, and after doing all he could to get a higher bid. The purchasers acted in good faith. A bill in equity was brought for accounting—Staples vs. Sprague—in which the two associates who were not consulted asked that the other three be charged for the ice at a higher price, it being claimed that the plaintiffs were not bound by the sale made. The defendants insisted that a majority of partners, when acting in good faith, can sell the property of the firm in the due course of business. The Supreme Judicial Court of Maine agreed with the defendants. Judge Walton, in the opinion, said: "In the absence of fraud, each one of a firm has the complete right to dispose of the whole partnership interests, and is considered to be the authorized agent of the firm. And in case of an actual disagreement, the weight of authority is in favor of the power of a majority of the firm, acting in good faith, to bind the minority, and such ought to be the law; for where there is a community of interest, certainly it is the will of the majority, and not the will of the minority, that ought to control. If there is a fraudulent combination on the part of the majority to injure or oppress the minority, the law is otherwise."

A New Style of Gun.—The Otis Iron and Steel Company, of Cleveland, have a contract with the Government for furnishing for its use steel wire, or the material from which it will be drawn, for a new style of heavy gun, invented by Dr. Woolbridge. This will have a 10-inch bore and be from 24 to 25 feet in length, consisting of a steel cylinder surrounded by 12 hammered-steel bars, 4 inches in diameter and reaching the entire length of the gun. These will stand the longitudinal strain. Around these steel bars is wrapped the wire. Ordinarily one would suppose that the interior coils of the wire would have to withstand the strain. This, however, is provided for. The part of the Otis Iron and Steel Works is to manufacture steel billets of the finest quality of metal, according to the Government's specifications. These are sent to Toronto to be drawn into wire 3/4-inch cross-section without annealing. This will sustain a force of from 180,000 to 190,000 pounds to the square inch. The wire, while under tension, is wrapped around the bars, which have been placed around the steel cylinder of the gun. Thirty thousand of these billets will be manufactured, a part of which will be used on a heavy gun to be made at the South Boston Iron Works, in which a cast-iron cylinder will be reinforced near the breech by steel wire.

About \$30,000,000 of Boston capital is invested in the Mexican Central Railway, which now operates a continuous line of 1225 miles, from the United States border at El Paso, Tex., to the City of Mexico. The two ends met March 8, at Fresno, 750 miles from El Paso and 475 miles from the City of Mexico. The work has been done in four years, at a cost of \$30,000,000. The first subscription, in March, 1880, realized \$5,400,000; the second amounted to about the same; the third yielded \$6,032,000, and the fourth, last year, the same as the third. There has been no failure to meet the terms of the subscription. The Mexican Government aided with a subsidy.

It is reported that work is now being rapidly pushed on the Charing Cross and Waterloo Road, which will run from the Waterloo Station of the London and South-western Railway to Charing Cross, a distance of 5 furlongs and 2 chains. The capital of this road is £100,000, and the conditions are that the company can only use electricity as the motive power. The road passes under the Thames in a tunnel which is now being dug. The Siemens have taken a contract to operate this road for a year. Another company, with a capital of £500,000, have laid out four new short routes of electric railroads in London. These roads will both employ the Siemens dynamos to furnish the current.

The largest window-glass works in this country are located at Belleveron, Fayette County, Pa. One roof covers three 10-foot melting furnaces and the same number of blowing furnaces.

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forge Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

BEST CAST U.S. TOOL STEEL BROWN & CO. PITTSBURGH, PA.

H. H. HARVEY, Augusta, Me.,

Manufacturer of RAILROAD, MINERS', BLACKSMITHS', STONE AND MARBLE CUTTERS', GRIST MILL AND BOILER MAKERS' HAMMERS AND TOOLS.

CATALOGUE ON APPLICATION.

SEE ILLUSTRATED ADVERTISEMENT IN THE FIRST ISSUE OF EACH MONTH.

ESTABLISHED IN 1866.

GOOCH PEERLESS GIANT FREEZERS.



INCREASE OF SALES NINE HUNDRED PER CENT. SINCE 1879.

These Freezers have grown into such popularity that they are universally acknowledged by the trade to be without an equal, and are kept in stock by most of the leading dealers in every State of the Union.

We scarcely ever lose a customer who tries our goods, and all we ask is an order for a sample, and we will send you the best and handsomest Freezer you ever saw.

SEND FOR SAMPLE.

MANUFACTURED BY

THE GOOCH FREEZER COMPANY,
CINCINNATI.

NEW ENGLAND AGENTS:
ADAMS & WESTLAKE MFG. CO.,
45 Summer Street, Boston.

NEW YORK AGENTS:
W. H. QUINN & CO.,
99 Chambers Street.

Eureka Patent Shear

For Cutting Round and Flat Bar Iron and Sheet Metal.
MADE ENTIRELY OF CAST STEEL.

Cheapest and best tool for the purpose ever put on the market.

MADE IN TWO SIZES:

No. 1 will cut up to 1/2-in. Flat and 1/4-in. Round.

No. 2 will cut up to 3/4-in. Flat and 1/2-in. Round.

Send for Descriptive Circular.

EUREKA SHEAR CO.,
811 Market St., Philadelphia, Pa.



RHODE ISLAND HORSE SHOE CO.,

MANUFACTURERS OF

Horse, Mule & Snow Shoes of the Perkins Pattern.

Works at Valley Falls, R. I.

Office, 31 Exchange Place, Providence, R. I.

W. CARPENTER, President.

C. H. PERKINS, Gen'l Manager.

E. W. COMSTOCK, Secretary.

Strap Hinges, 70 and 5 Per Cent., Delivered.

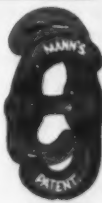
Manufacturers of 6, 8 and 10 inch Heavy Strap Hinges; quality equal to any made.

Also manufacturers of

MANN'S PATENT CONNECTING LINK FOR CHAINS.

Considered the Best in the Market for Lumbermen and all that use chains.

JAMES MANN & SONS, 75 Main St., Buffalo, N. Y.



Bit Braces.

Amidon Brace, 8 to 14 in. sweep.
Barker " " "
Empire " " "
Buffalo Ball Brace.
Brace Wrench.
Toy Braces, &c.



E. R. SAXTON,

31 Lloyd St.,

BUFFALO, N. Y.,

Sole Manufacturer.

Send for Illustrated Catalogue, Price List and Discou-

W. R. OSTRANDER & CO.,

19 ANN STREET, NEW YORK.

Manufacturers of

SPEAKING TUBES, WHISTLES, ELBOWS, ORAL ANNUNCIATORS, BELL & ELECTRIC WIRE TUBING.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Belts, &c. A full line of Speaking Tube Hardware constantly on hand. Catalogues on application. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I.



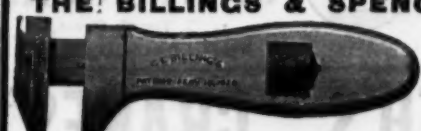
THE BILLINGS & SPENCER CO., Hartford, Ct.

THE BILLINGS PAT. POCKET WRENCH

And all descriptions of

DROP FORGINGS

for Guns, Pistols, Sewing Machines, and Machinery generally. Send for Catalogue.



UNION FOUNDRY AND PULLMAN CAR WHEEL WORKS,

N. S. BOUTON, President.

CORRESPONDENCE SOLICITED AND ESTIMATES MADE ON

HEAVY MACHINERY, AND ALL SIZES OF FLY WHEELS, PULLEYS, &c.

Special Machinery for Grain Elevators, Grain Steam Shovels, &c., contracted for. Car Wheels and Car Castings at lowest rates.

Office, First National Bank Building, CHICAGO.

THOS. H. DALLETT & CO.,

SUCCESSORS TO

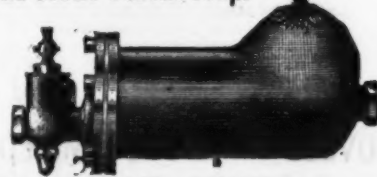
THORNE, DeHAVEN & CO., Drilling Machines,

21st Street, above Market, Philadelphia.

PORTABLE DRILLS, Driven by power in any direction. RADIAL DRILLS, Self-feed—Large Adjustable Box Table. VERTICAL DRILLS, Self-feeding. MULTIPLE DRILLS, 2 to 20 Spindles. HORIZONTAL BORING AND DRILLING MACHINES. HAND DRILLS. CAR BOX DRILLS. SPECIAL DRILLS, For Special Work.



The Curtis Steam Trap.



Has automatic air discharge; has a differential opening, thus discharging all the water as fast as it comes. Is very accessible for cleaning, the valve being on the outside. Send for circular. Manufactured by the

CURTIS REGULATOR CO.,
61 Beverly St., BOSTON, MASS.

GENERAL AGENTS: 109 Liberty St., N. Y.; 925 Market St., Phila., Pa.; 240 Market St., Chicago, Ill. and Cor. Haliday and Saratoga Sts., Baltimore, Md.

COBB & DREW
Plymouth, Mass.,

Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to order.

NEW YORK AGENCY,

GRUNDY & DISOSWAY,

165 GREENWICH STREET,

Agents for the Philadelphia Star Carriage and Tire Belts.

ONEIDA ALARM TILL.

SUSCEPTIBLE OF OVER 100 CHANGES.

Better than any other Till in the market. No tampering with keys, as it alarms every time a key is touched, unless acquainted with combination. Send for prices and compare this Till with others in the market. No Till-tapping possible.

MANUFACTURED BY

THE ONEIDA ALARM TILL CO.,

EAST SYRACUSE, N. Y.

PATENTS.

H. N. LOW,

Attorney and Counsellor-at-Law.

SOLICITOR OF PATENTS,

OFFICE, 501 F STREET, WASHINGTON, D. C.

Patents procured in the United States or Foreign Countries. Personal attention to all practice before the Patent Office or Courts.

Handbook of information sent free upon application.

BUCKEYE FORGES

BEST AND CHEAPEST MADE

ELECTROTYPING

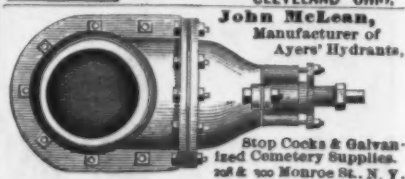
STEREOTYPING AND ENGRAVING

10 FRANKFORT STREET, CLEVELAND OHIO.

John McLean, Manufacturer of Ayer's Hydrants.

Stop Cocks & Galvanized Cemetery Supplies.

208 & 200 Monroe St., N. Y.



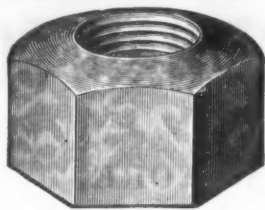
STEEL FORGINGS

From 100 Pounds to 10,000 Pounds.

Pennsylvania Steel Company.

Address

L. S. BENT, Supt., Steelton, Dauphin Co., Pa., Or STEPHEN W. BALDWIN, Agt., 160 Broadway, N. Y.

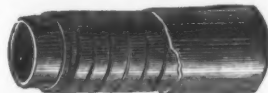


WE ARE MAKING
FINISHED HEXAGON NUTS,
with Face and Sides TRUE, Thread and Size U. S. Government Standard, and case-hardened or not, as desired. PLEASE TRY THEM. These Nuts are worked with much care, and we direct particular attention to their accuracy and excellence of finish.

TRUMP BROS. MACHINE CO.,
WILMINGTON DEL.

A. WYCKOFF,

Manufacturer of



WOOD WATER PIPE

FOR

MINES, COKE OVENS AND
WATER WORKS.

**Chain Pump Tube,
Curbs, &c.**

ELMIRA, N. Y.

R. COOK & SONS,

Manufacturers of

Carriage & Wagon AXLES.

WINSTED, CONN.

ESTABLISHED 1839.

N. Y. MALLET and HANDLE WORKS



Manufacturers of

Calipers, Carpenters', Stone Cutters',
Tin, Copper and Boiler Hammers,
MALLETS,

Hawking Beetsles, Hawking and Calking Irons;
also all kinds of Handles, Sledge, Chisel and Hammer Handles, Also

COTTON AND BALE HOOKS.
Patented Feb. 13, 1877; a new combination of Hooks.
436 E. Houston St. New York City.

168
CHAMBERS ST.
NEW YORK CITY
F. R. EMMONS & BRO.
TACKS
E. PHILLIPS & SONS.
Manufacturers
SO. HANOVER,
MASS.



PATENTED
C-SPRING CART CO.,
RUSHVILLE, IND.

We are making a Road Cart that is strong, light,
easy on the horse and sides as easy as a buggy.
Easy to get in and out of. Cut shows No. 3, with
seat swung back ready to enter. Write for catalogue and prices.



Seamless Cotton and Mildew-proof, Rubber Lined
"Eureka Garden Hose"
IN 1/2 AND 1 INCH SIZES.
Price Lists and Discounts on application.
EUREKA FIRE HOSE CO., 13 Barclay St., NEW YORK.

KEYSTONE SCREW CO.,
17th and Venango Sts., Philadelphia.
J. BILLERBECK,
Manufacturer of
IRON AND BRASS
Gimlet-Pointed Wood Screws.
WRITE FOR DISCOUNTS.

Vulcanized Rubber Fabrics

ADAPTED TO

MECHANICAL PURPOSES.

RUBBER BELTING and PACKING.

Machine Belting,
Steam Packing,
Leading Hose,
Suction Hose,
Grain Elevators,
Steam Hose,
Piston Rod Packing,
Gaskets and Rings,



Vacuum Pump Valves,
Ball Valves,
Car Springs,
Wagon Springs,
Gas Tubing,
Machine Belting,
Billiard Cushions,
Emery Wheels.

This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for the Anchor, Dole & Co., of Chicago, Vanderbilt's Elevators for the N. Y. Central & Hudson River R. R., the great Elevators of the Penna. and Erie Railroads, of Jersey City and Hoboken, Dow's Stores, of Brooklyn, and many others; in fact, the largest Belts for the largest Elevators in the world.

A single carrier belt in the Penna. R. R. Elevator is over 250 feet long, weighing 15,000 pounds, and has run perfectly from the start.

LINEN and COTTON HOSE.



Plain and Rubber Lined.

Circular Woven-Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c



"TEST" HOSE.

"CABLE" ANTISEPTIC.

Emery Wheels and Packing.

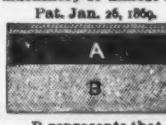


ORIGINAL

Solid Vulcanite EMERY WHEELS

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting, grinding and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Plows, Saws, Store, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements, and small Machinery of almost every description.



PATENT ELASTIC Rubber Back Square Packing.

BEST IN THE WORLD.

For Packing the Piston Rods & Valve Stems of Steam Engines & Pumps.
B represents that part of the packing which, when in use, is in contact with the piston rod.
A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight and yet creates but little friction.
This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

Corrugated Rubber Mats and Matting.



For Halls, Flooring, Stone and Iron Stairways, &c.

This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap, inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address



NEW YORK BELTING & PACKING CO.,

Warehouse, 13 & 15 Park Row (Opposite Astor House), New York.

JOHN H. ONEEVER, Treasurer.



BUCK BROTHERS, Millbury, Mass.

The most complete assortment in the U. S. of
Shank, Socket Firmer and Socket Framing Chisels.
PLANE IRONS.

CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also "Riverlin Works."

PHOSPHOR-BRONZE

—FOR—

BEARINGS, SLIDE VALVES, CYLINDER RINGS, CROSS-HEAD GIBS, STEPS, BUSHINGS,

And all purposes where Maximum Durability, Anti-Frictional and Non-Cutting Qualities are Desirable.

**PUMP RODS,
BOLTS & NUTS,
MACHINE and WOOD
SCREWS, &c., &c.**
Combine Toughness, Strength, Durability and Resistance to Corrosion.



"Phosphor-Bronze."

CASTINGS OF ALL KINDS TO ORDER.
SEND FOR PAMPHLET AND PRICES.

THE PHOSPHOR-BRONZE SMELTING CO., LIMITED,
No. 512 Arch St., PHILADELPHIA, PA.
Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the U. S.

MERRILL BROS., 26 First St., Brooklyn, E. D., N. Y.

Chimney Construction.

From a paper recently read before the British Civil and Mechanical Engineers' Society, by Messrs. R. M. and F. J. Bancroft, we take the following interesting matter concerning chimney construction:

Foundations.—In building large chimneys one of the most important points is the construction of the foundation. Very much will depend, of course, upon the nature of the ground. When we are on solid rock, it is only necessary to excavate to such a depth that the heat of the gases will not materially affect the natural stone, and to a depth sufficient to allow the necessary spreading of the base. In many instances, however, chimney stacks have to be built near rivers and on sites where the upper strata are of alluvial clay or made ground, and it is necessary to carry the foundation deep down until a stiff clay, hard sand or rock bottom is reached; this frequently entails excavation 25 or 30 feet deep or even more, and it is not only requisite that the foundation should be large enough to carry the superincumbent weight, but also that it should be of such an area that it will not allow the base to be forced into the yielding ground. These deep foundations are usually constructed of concrete. In some cases piles are driven in to form the foundation, as, among others, in a brick chimney erected at Boston and in an iron chimney constructed in Ohio. This is a measure on which the engineers must decide upon the advisability of using it, so as to economize material without risking unequal subsidence, which cannot be too carefully guarded against; and, in fact, it is the practice in the erection of tall stacks to construct the foundation and pedestal, if any, and allow them to stand some considerable time before proceeding with the shaft proper, in order that the work may set and any slight settling take place before a great weight is built upon it. As a remarkable instance of the general settlement of the foundation of a shaft, we may mention a chimney which was built over a quicksand in which an iron rod sank to a depth of 15 feet with little more than its own weight as pressure. During the erection the concrete foundation sank bodily 1 foot 4 1/2 inches without cracking the shaft or causing it to deviate from the perpendicular. From this it will naturally follow that in all cases the ground at the foundation should be equally resistant, or unequal settling will take place. Some of the pressures exerted upon the foundation are given under the respective descriptions of the chimneys.

Cappings and Cornices.—The stone coping or cornice of a chimney will seldom require more to hold it together than two good cramps across each joint; they should be of copper, or double-dovetailed slate dovels. On no account should iron cramps be used, as they will oxidize and burst the stone. Heavy and large caps are often the source of great danger, inconvenience and expense, as the cap at top in a gale of wind acts upon the shaft as a weight at the end of a long lever. The cap, when finished, should be a complete whole, or so bound together that the joints cannot open, and be so proportioned that its center of gravity is within the outer circle of the shaft on which it rests, and it should be designed so that the wind striking against it is deflected upward.

Bond.—In large factory chimney shafts, the longitudinal tenacity which resists any force tending to split the chimney is of more importance than the transverse tenacity; therefore, in these structures it is advisable to have, say, three or four courses of stretchers to one course of headers. In some circular stacks a uniform header-bond for the outside courses of brickwork is adopted. This is a practice condemned by some authorities.

Wind Pressure.—It is usual in this country (England) to estimate, as the maximum pressure, 55 pounds per square foot, but, as in 1868 the pressure of wind at Liverpool was registered at nearly 80 pounds per square foot, it is advisable to take a higher factor. If the wind pressure on a square chimney be taken as 1, that on an hexagonal chimney may be taken as .75; that on an octagonal chimney may be taken as .65; that on a circular chimney may be taken as .5.

Wrought-iron Chimneys.—Wrought-iron shafts have found great favor in America and Russia, but in England and the Continent generally, as far as we have been able to ascertain, they are an exception. In addition to the wrought-iron shafts detailed in this paper, we have been informed of the following: Messrs. Witherow & Gordon, of Pittsburgh, Pa., have since 1876 built upward of 30 wrought-iron shafts, varying in height from 100 feet to 190 feet, and from 5 feet to 9 feet in diameter. The firm write us that these shafts answer admirably the purpose for which they were built. Mr. L. S. Bent, superintendent of the Pennsylvania Steel Company, Steelton, Pa., states that his company have the following eight wrought-iron shafts in use, and have found them both durable and economical:

No. 1, 170 ft. high, 6 ft. 6 in. diameter, built in 1881.

No. 1, 165 " 6 ft. 6 in. " " 1877.

No. 1, 135 " 7 ft. 0 in. " " 1880.

No. 1, 112 " 6 ft. 0 in. " " 1881.

No. 4, 110 " 7 ft. 0 in. " " 1870, 74-75-76.

They are lined for 30 feet with 9-inch fire-brick, and the remainder of height with 4-inch red brick. The Ravensdale Iron Works chimney shaft, Tunstall, England, is a circular wrought-iron shaft, not spread at its base. Its height from ground line to top is 75 feet; outside measurement at ground surface, diameter, 6 feet; ditto at top, diameter, 6 feet. Seventy-five wrought-iron plates were used in the construction of this shaft, the thickness being 1/4 inch. The plates have a lap of 2 1/4 inches, and are riveted together with 3/4-inch cup-headed rivets. The shaft is lined its entire height with fire-brick. The shaft carries off the fumes from three boilers. The wrought-iron chimney of the Nine Elms Cement Works, Cliffe Creek, Rochester, England, was erected in 1878. The shaft is circular, and parallel throughout, and is constructed of wrought-iron plates. The plates vary in thickness downward from 1/4 inch to 3/8 inch. Its height from ground level to top is 160 feet; external diameter throughout, 5 feet; internal diameter throughout, 4 feet 6 inches. It is lined with 3-inch fire-brick its entire height.

The chimney is stayed against the wind by four 3 1/2-inch steel guy-ropes.

This chimney was erected over the center one of a row of nine cement kilns which are all connected to shaft by a wrought-iron horizontal flue 4 feet in diameter. Two additional ones have since been added, and the chimney now carries off the gases from 11 cement kilns. Round the outside of center kiln on ground level is fixed a cast-iron curb or base plate. On this base stand four cast-iron standards or supports having their lower ends butting on to and secured to base-plate. The standards incline inward until their upper ends meet to support a cast-iron circular chimney-base which forms the top of the center kiln. The wrought-iron chimney proper commences from top of this circular cast-iron base, directly over which the 4-foot horizontal flue is connected to shaft. For the construction of this chimney a timber stage was erected at the level of the kiln tops, and upon this stood the rivet fires. Four winches were worked on this stage, and to them were led guy-ropes, after passing round blocks at convenient distances. A hydraulic press, with a 4-foot stroke, was then fixed over the center kiln, and the top length of 20 feet, which had previously been riveted-up on the ground and raised to the stage level, was placed upon the ram. The ram was then pumped up and the 20-foot length raised a height of 4 feet, the guy-ropes being slackened out to the required extent as the 20-foot length gradually rose. A 4 foot ring of plating was then riveted on with 3/4-inch snap-head rivets and the usual lap, the ram was again pumped up, and the now 24-foot length raised the necessary height; another ring of plates was then riveted on, and the operation repeated until the chimney had reached its required altitude. The cost of this chimney was about \$5000, including long wrought-iron flues.

Messrs. Wesenfield & Co.'s Chimney, Chemical Factory, Barmen, Prussia.—This has a square brick pedestal and an octagonal brick shaft. Its total height from foundation to top is 345 feet; height from ground line to top, 331 feet. The pedestal is 20 feet square by 40 feet high by 7 bricks (equal to 5 feet 3 inches) thick. The octagonal shaft is 291 feet high, 17 feet outside diameter at the base by 5 bricks (equal to 3 feet 9 inches) thick; 11 feet outside diameter at the top by 2 bricks (equal to 1 foot 6 inches) thick. The shaft diminishes 2 1/2 inches every 10 feet in height, or 1 in 48. The internal octagonal clearance is 8 feet throughout. The foundation is on a bed of hard and coarse gravel, and made of large, flat quarry stones bedded with "terrass" mortar in the proportions of 1 lime, 1 river sand and 1 "terrass" (a kind of pozzuolana). The pressure on the lowest part of chimney proper is equal to 21,335 pounds, or 9 1/2 tons, per square foot. The pedestal and shaft were built with bricks and ordinary mortar composed of 1 of lime to 2 of river sand, prepared every morning by the masons themselves. On rainy days cement mortar was used in the proportion of 1 cement to 2 river sand. The courses of brickwork were flushed up with cement as construction proceeded. The crown of the shaft was built with cement exclusively. The foundation and pedestal were built in the summer of 1867, and the construction of the chimney was successfully completed in October of the same year. According to the original design, it was intended to build to a height of 260 feet, but, as the erection was proceeding in a very satisfactory manner, it was considered safe to increase the height without altering the dimensions of the base. But before doing so, a comparison was made between the pressure on the foundations of this chimney and the pressure on the foundations of a chimney erected at Bochum, Prussia. These were found to be as follows:

	Lowest part of chimney proper.	Press. per sq. ft.	Press. per sq. in.
Chimney at Barmen, Prussia.	21,335	149	
Chimney at Bochum, Prussia.	18,129	129	

Excess on pressure on Barmen chimney foundation..... 2,906 21

The three masons who constructed the chimney daily changed their positions, so as to equalize any unevenness in their respective laying. Every 50 feet a course of brickwork was painted black, so as to indicate the height of any point of the chimney above ground. The chimney was built from the inside. The materials were hoisted by a steam engine erected temporarily near the place of construction. The frame which supported the upper drum over which the chain worked was moved higher after the completion of every three or four courses, and was at the same time turned horizontally from one side of the octagon to the next one, so as to equalize the pressure of the frame on the masonry. The holes made into the masonry to support the frame were filled up with bricks and mortar immediately after the removal of the frame to a higher level. The chimney, when completed (October, 1867), was vertical. In the spring of 1868, remarkable for storms and long continued gales, this stalk inclined toward the northeast by the action of the southwest wind, probably aided by the softness of the mortar and the large size and shape of the ornamented chimney crown, which caught the wind and acted as a long lever. The deflection was considerable at the end of May, and apparently increased. As before mentioned, layers of bricks in the shaft at distances of 50 feet from each other were painted black. The height of these black lines above the pedestal being known, they were, by means of a theodolite, projected on a board which was fixed on the pedestal, and these projections showed that at

51 ft. high the chimney was out of plumb 45 inches.			
210 "	"	"	30 "
160 "	"	"	15 "
110 "	"	"	5 "

The pedestal stood perpendicular. As the canting of the shaft was still increasing, immediate action had to be taken. The ordinary method of straightening chimneys was at first resorted to. A hole was made through the whole thickness of the masonry on the side of the chimney which required lowering, at a distance of 4 feet above the top of the pedestal; into this hole a saw was passed and an attempt was made to cut through one-half of the shaft, but, owing to the thickness of the wall and the hardness of the bricks,

BUFFALO PORTABLE FORGES AND HAND BLOWERS.



Warranted Superior to any other make, and
Guaranteed to give Perfect
Satisfaction.

For sale by all the leading
Iron, Hardware and Machinery
Dealers throughout the country

BUFFALO FORGE COMPANY, BUFFALO, N. Y.

Send for Complete Catalogue.

"ACME" PULVERIZING HARROW, Clod Crusher AND Leveler.

AGENTS
WANTED.



It is the Most Popular and Best Selling Agricultural Implement on Earth. We make a Variety of Sizes working from 4 to 15 Feet Wide. Send for Pamphlet containing Thousands of Testimonials from 46 different States and Territories.

Branch Office: HARRISBURG, PA. **NASH & BROTHER,** Manufacturing and Principal Office: MILLINGTON, N. J.
N. B.—Pamphlet "TILLAGE IS MANURE" Sent Free to Parties who NAME THIS PAPER.

J. M. SCHOONMAKER, MANUFACTURER AND SHIPPER OF

CONNELLSVILLE COKE

Capacity of Mines, 2500 Tons Daily.

Siding connections with all lines of Railroads.

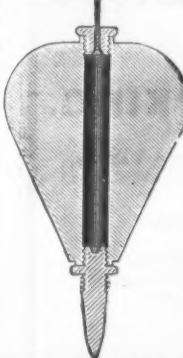
Office, 120 Water Street, PITTSBURGH, PA.

PENFIELD BLOCK COMPANY
LOCKPORT, NEW YORK.
MANUFACTURERS.
AGENCIES WITH
H.B. NEWHALL CO. NEW YORK & BOSTON.
S.H. & E.Y. MOORE CHICAGO.
WOOD AND WROUGHT IRON BLOCKS FOR RAILROAD AND MINING WORK A SPECIALTY. LARGEST AMERICAN MANUFACTURERS OF WROUGHT BLOCKS. CATALOGUES FURNISHED AND SAMPLE ORDERS SOLICITED.

Keystone Portable Forges.
Best in the Market. Strong Blast and Easily Worked.
Durable, and give entire satisfaction. All sizes for every kind of work. Also
Pressure Blowers AND Exhausters.
Send for Catalogue.
MANNING, MAXWELL & MOORE.
New York Agents, 111 Liberty St.
Keystone Portable Forge Co.,
204 North Fourth Street,
PHILADELPHIA, PA.

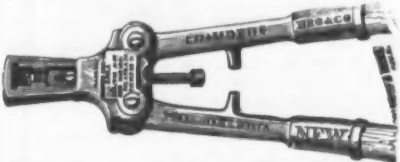
Vajen's Patent Reversible Plumb Bob.

Point and Cap Interchangeable. Pat. Nov. 14, 1882.



This new and perfect Plumb Bob, designed to overcome all the disadvantages of other plumb bobs, is capable of being adjusted to any and all the forms required by the Millwright, Mechanic and Civil Engineer, has no equal and cannot be improved upon. It has the only proper shape for a bob, having a hole extending entirely through it, with a reversible, we I-tempered Steel Point and Screw Cap, which, being interchangeable, enables the Bob to be suspended in the several positions as shown in cuts. The hole in the center of the Bob affording protection for the point when not in use. By filing the shoulder the Bob can always be adjusted and made true. The Plumb Bob is made of brass and nickel-plated, furnishing as pretty and as valuable a tool as there is in the market. We recommend it in preference to all other combination bobs, and guarantee it to give perfect satisfaction. This Plumb Bob is made in four sizes: 1, 2, 3 and 4 lbs. A liberal discount to the trade. Send for Price List.

Manufactured by
VAJEN & NEW, Indianapolis, Ind.
For Sale by all Hardware and Tool Merchants.



BOLT & RIVET CLIPPERS.

For cutting off the ends of Bolts and Rivets, on carriages, wagons, harness, etc. Ask for them where you buy your hardware, or send for circular and price list.

CHAMBERS, BROTHER & CO.,
52d St., below Lancaster Ave.,
Philadelphia, Pa.

LIVINGSTON HORSE NAIL CO.

104 Reade Street, NEW YORK,

AGENTS FOR

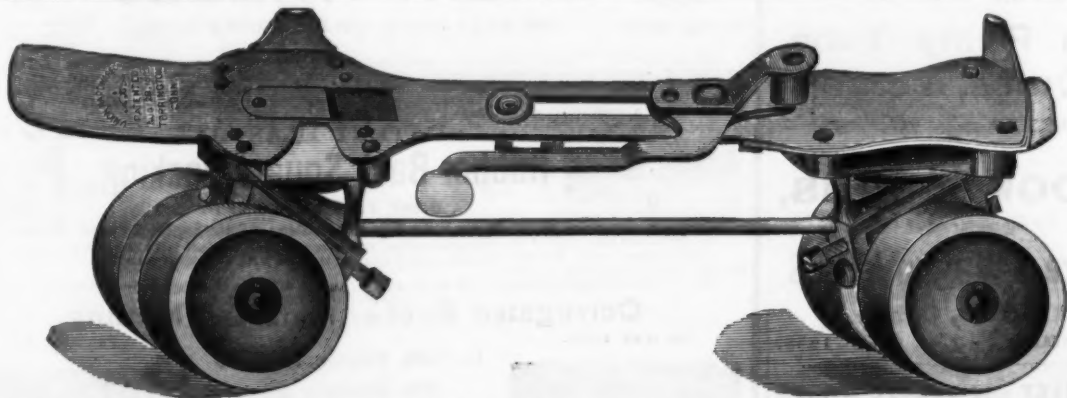
PUTNAM,

GLOBE,

VULCAN

and EMPIRE

HORSE NAILS.



We offer our New Patent Self-Adjusting Lever Rink Roller Skate, with foot-plate and working mechanism made of crucible steel, blued or nickelled. Malleable Iron Trucks, Adjustable Rubber Springs, Steel Axles and Boxwood Wheels. This is the best Guideable Rink Skate ever offered to the public. We also manufacture the Standard Scientific and New Rink Roller Skates, with wood tops; also New York Roller Skates. Our Illustrated Catalogue, just issued, showing the most complete line of Roller and Ice Skates ever offered to the trade by any manufacturer, will be mailed on application.

UNION HARDWARE COMPANY,
75 Chambers St., NEW YORK. **Manufactory, TORRINGTON, CONN.**

ONE SET HOLDEN'S PATENT NEST OF SAWS.

Keyhole Blades.....\$1.50
Compass ".....2.50
Pruning ".....5.50
Patent Handles.....2.50

Nests Complete.....\$12.00

DISCOUNT.....

Packed 1/2 Doz. Sets in Box.

WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.



The Scientific PORTABLE Forges



Entirely New in Principle.
No Ratchets, Pawls or Friction Device
Awarded Two Medals at Cincinnati Exposition, 1883
13 Styles and Sizes.
Perfect satisfaction guaranteed. Manufactured by
THE FOOS MFG. CO., Springfield, Ohio.
Send for catalogue, mentioning this paper.

PAT. GAS GENERATOR

makes gas for heating and illuminating perfectly safe. No smoke; steady flame; one-tenth cost of coal gas. For Dwellings, Churches, Factories, &c. No extra insurance. Has been used in large tinning and canning works over two years with greatest success. Can guarantee perfect satisfaction. Prices reasonable. Send for Circulars and Price List.

NATIONAL GAS & MFG. CO., Cleveland, Ohio.

WATER.

CITIES, TOWNS AND MANUFACTORIES

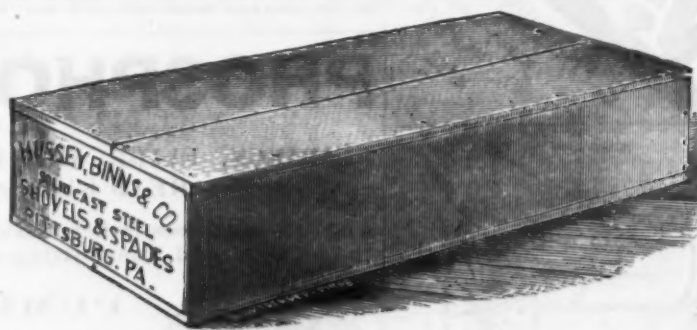
SUPPLIED BY GREEN & SHAW

Patent Tube and Gang Well System.

WM. D. ANDREWS & BRO.,

233 Broadway, New York.

Infringers of above patents will be prosecuted



PRICES QUOTED ON APPLICATION.

**HUSSEY,
BINNS
& CO**

(LIMITED),

PITTSBURGH.

DURRIE & McCARTY,

NEW YORK AGENTS.

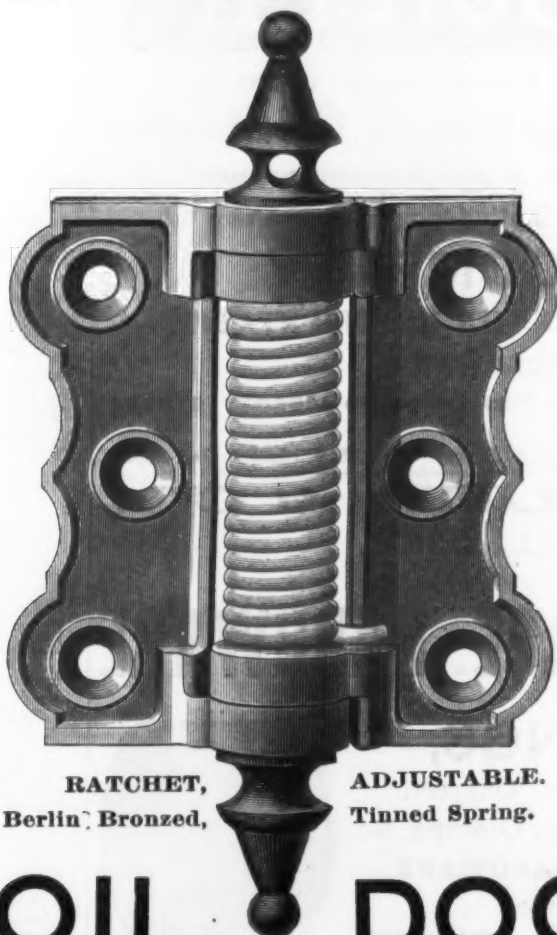


One Dozen (Box) No. 520, Opened Ready for Sale in Store.

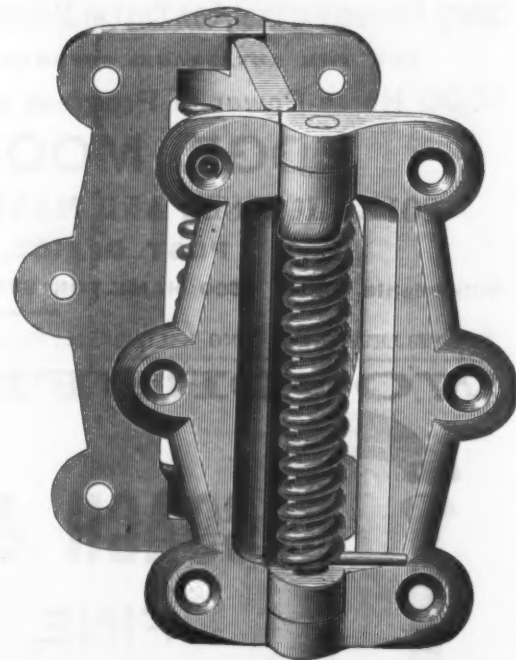
SARGENT'S SPRING HINGES.



MALLEABLE IRON, BRASS SPRING.
No. 250, To Swing One Way.



RATCHET, ADJUSTABLE.
Berlin Bronzed, Tinned Spring.



MALLEABLE IRON, BRASS SPRING.
No. 2250, To Swing Both Ways.

ROD AND COIL DOOR SPRINGS.

"S" DOOR SPRINGS.

TORREY DOOR SPRINGS.

THE VICTOR.

THE CHAMPION.



Put the Brackets on as seen in the cut, and on the opposite side of the Steel Rod for a door swinging the other way.

Put the ratchet wheel in the bottom bracket, with the teeth toward the Pawl or Stop.



Apply the wrench to the end of the rod below the bottom bracket, twist the rod until sufficient power is obtained, and then push the pawl into the teeth of the ratchet wheel.

Either
Right or
Left Hand.

Packed Complete
with Screws
and Wrench.

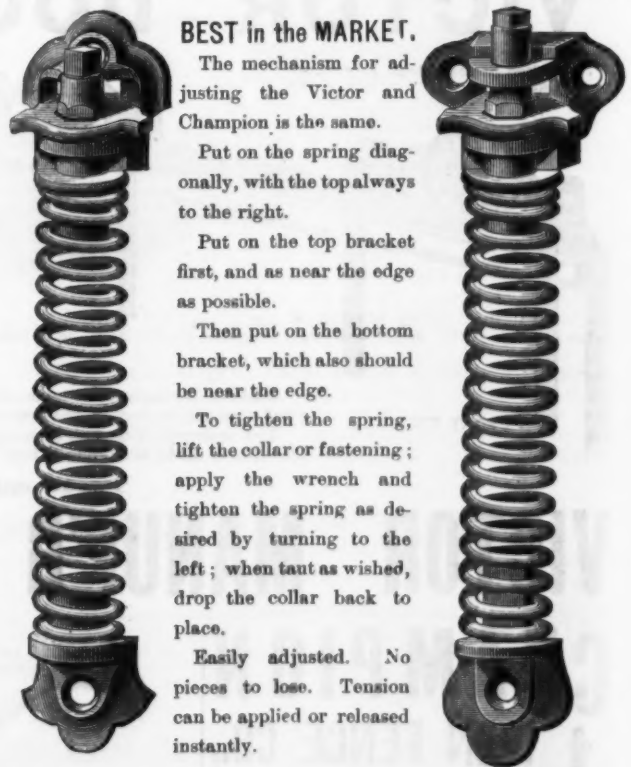
Bottom Bracket, with Ratchet
Wheel and Pawl in Place.



This spring can be put on and ANY AMOUNT OF POWER APPLIED easily and quickly, and it is equally applicable to closing the door or holding it open. By simply SLIDING THE CATCH the power can be instantly removed and the door allowed to act entirely free.

The same Spring is suitable for a right or Left Hand Door.

Packed
Complete
with Screws
and Wrench.



BEST in the MARKET.

The mechanism for adjusting the Victor and Champion is the same.

Put on the spring diagonally, with the top always to the right.

Put on the top bracket first, and as near the edge as possible.

Then put on the bottom bracket, which also should be near the edge.

To tighten the spring, lift the collar or fastening; apply the wrench and tighten the spring as desired by turning to the left; when tant as wished, drop the collar back to place.

Easily adjusted. No pieces to lose. Tension can be applied or released instantly.

HAMMOCK AND SWING HOOKS AND AWNING PULLEYS.



HAMMOCK HOOKS.
No. 67, Galvanized.
No. 68, Tinned.

No. 57, Galvanized.
No. 58, Tinned.

SCREW HOOKS,
Plain and Galvanized.
From 5-16 inch to 3-4 inch, Iron.

EYE BOLTS,
Plain and Galvanized.
From 5-16 inch to 3-4 inch, Iron.

SWING HOOKS, Plain and Galvanized.

1-2 x 10 Inches and 5-8 x 11 1-2 Inches.

AWNING PULLEYS.
All Sizes.



SARGENT & Co. HARDWARE MANUFACTURERS. NEW YORK & NEW HAVEN, CONN.

INDUSTRIAL ITEMS.

MAINE.

The Portland Stove Foundry, damaged by fire some weeks since, has commenced melting, extensive repairs and improvements having been completed.

MASSACHUSETTS.

James F. Sullivan's water motor is working in Fitchburg. It is running an 18-inch engine lathe, a 10-inch hand lathe, 24 feet of shafting, two 12-inch emery-wheels and a grindstone, all with 3/4-inch steam from the low service. Mr. Sullivan has applied for a patent.

A new tack firm has recently been established at Kingston. L. E. Ford and O. M. Maglathlin, from Cobb & Drew's works, have leased the Henry Soule factory, in which they have 10 machines already running.

The Chapman Valve Company, of Indian Orchard, are running their entire shops to their full capacity, giving employment to 160 hands. They have recently put in spur tracks running to all their buildings, also a large number of new tools, many of them large ones, among which is a planer large enough to plane a 48-inch valve. This spring they will build an addition to their brass foundry. They have, the past winter, supplied several Southern cities with valves and hydrants for their water-works, have just made a shipment of valves and hydrants to Switzerland, and are also supplying with valves a large number of machines for making artificial ice.

CONNECTICUT.

The name of the American Clock and Brass Company, of Bristol, has been changed to the American Trading Company, by the Legislature of the State.

NEW YORK.

The Queen of the Harvest Manufacturing Company, of West Chazy, are unable to meet maturing obligations, owing to complications with O. K. Wood & Co., who own about all the stock of the company. The company owe \$35,000, and have nominal assets of \$137,000, composed of machinery, uncollectable debts and unavailable personal and real property.

NEW JERSEY.

The Trenton Lock and Hardware Company have made some important additions to their works, including a new 80-horse-power union boiler and a new fire-proof building for japanning and bronzing. They have also introduced steam heating through the entire establishment. The works are being run to their full capacity, the demand for their goods showing a steady increase. They make a specialty of the finest class of hardware, their bronze goods being of remarkably fine quality.

PENNSYLVANIA.

After many delays and postponements it is now authoritatively announced that the sheet mill in New Castle, lately the property of Reis Brothers, which was knocked down to P. L. Kimberly & Co. at sheriff's sale, will start up. In connection with the starting of the works, it is announced that Peter Kimberly, of Sharon, will make New Castle his permanent home. Also that George L. Reis, of New Castle, will not go to Knoxville, Tenn., but will take a position in the Kimberly Mill, at Sharon.

The Greenville rolling mill of P. L. Kimberly & Co. was recently started up with from 10 to 15 of the 26 puddling furnaces. If business increases, the rest of the mill will be put into operation.

The Pittsburgh Steel Casting Company on the 4th inst. rolled in six hours 92,940 pounds of shaped deck-beam blooms. At no time in the operation was it over 60 minutes from the melted iron to the shaped bloom. The steel was of low carbon, with a guaranteed elongation of 23 per cent. in 8 inches. The special difficulty in rolling deck-beam shapes is that there is 23 per cent. more reduction on one side than the other. This method will, by rolling direct from the ingot, tend to greatly reduce the cost of producing shapes of all kinds. A patent has been applied for by the Pittsburgh Steel Casting Company which will cover this process. The steel casting which we mentioned last week as having been tested by the Government with such excellent results were furnished by this company.

The Scranton Steel Company have come to the front again with a better record of steel production than previously reported. In a recent week, with their two 4-ton converters, the company produced 1378 gross tons of ingots, working only six turns of 12 hours each. During these six turns their rail mill rolled 1247 gross tons of rails. At this rate, on double turn, the annual capacity of the works would be over 140,000 tons of ingots and over 125,000 tons of rails.

At Roger's Ford, Buckwalter & Co. are working with their apprentices and having their castings made at three different foundries. The striking molders are still holding out.

The cinder crusher recently put up by the Plymouth Rolling Mill Company, at Conshohocken, has been successfully started. The crusher is a Gates patent, manufactured in Chicago; the motive power consists of a 50-horse-power engine built in Erie. The amount of cinder expected to be crushed will be about 200 or 300 tons per day.

John L. Kelley, manufacturer of the Keystone steel boiler tube-cleaners, Erie, has capacity for making 250 tube-cleaners per week, and is shipping an average of 100 per week, and expects to largely increase.

The blast furnaces of New Castle are making fine outputs. Last week Etna Furnace scored 777 tons, and Neshannock Furnace 800. The figures of Rosena and Clara furnaces are not at hand, but they are well up to the same.

There is now a better business outlook in Danville than there has been for months past. After weeks of idleness the Danville Nail Works are in full operation, a satisfactory adjustment of the difficulty between the

employers and employees having been made with reference to the wages. It is thought that this adjustment will be permanent in its character and beneficial in its effect. The Danville Steel Company have again started their mill, and have enough orders to keep them in operation for some time to come. It is to be hoped that the Montour Iron and Steel Company will soon follow in the wake of the above movement and put their large works in operation to their fullest capacity.

It is stated that a new charcoal furnace has been built at Bower's Station, Berks County, which will soon be put into operation.

Preparations for the new steam forge about to be erected at Spring City are now rapidly being made. Material for the building is arriving, and work will be pushed forward as rapidly as the weather will allow. The forge is expected to be in running order by August or September.

One of the Pottstown Iron Company's gas furnaces, erected at a cost of \$40,000, exploded on Tuesday, March 8, without injuring any person. Dampness of the flue is the supposed cause.

The Pine Iron Works of Bailey & Shoemaker, in Berks County, are again in operation rolling blooms.

Early on last Saturday morning the extensive machine and pattern shops connected with the foundry of Miller & Tutton, in Downingtown, were totally destroyed by fire, together with all the patterns, tools, lathes and planers. The fire is supposed to have originated from a spark in the cupola. The loss is almost entirely covered by insurance.

The property of the Allentown Iron Company will be sold at public sale on May 7, under foreclosure proceedings by the bondholders. This sale marks the winding up of what was formerly one of the most prosperous manufacturing institutions in the country. The concern were originally an outgrowth of the iron manufacturing firm of Bevan & Humphrey, which constructed the first furnace on the Allentown property as early as 1846. On April 12, 1857, the Allentown Iron Company were incorporated with a capital stock of \$200,000, divided into shares of \$50 each. New and additional furnaces were constructed, and in many other ways were the facilities for manufacturing iron expanded. At one time the company employed 900 men. The business of the concern increased to such large proportions that the capital stock was gradually increased to \$1,000,000. Handsome dividends were paid for many years. The company, however, with many others, suffered by the great financial panic of 1873, and never recovered from the blow they then sustained. They have ever since been prostrated, and have paid no dividend for several years. Since December, 1882, they have neglected to pay the interest on their bonds. The company last January finally closed their works with a mortgage debt upon them of \$400,000.

The Lloyd Valve Company, of South Bethlehem, have bought the plant of D. E. Pierce & Co. In addition to their specialty of the self-packing valve, they will now manufacture fine machinery castings, from 1/4 pound to 4 tons, and brass and gun-metal castings of every description. The officers of the company are D. E. Pierce, president; W. A. Wilbur, secretary and treasurer, and Seth Lloyd, superintendent.

Our types last week made us say that Frances Furnace had been in blast "but four years since it was built." The fact is that the furnace blew for only four months during its life of 12 years.

Eagle Furnace of Curtiss & Co., at Roland, will blow in a week or two.

PITTSBURGH AND VICINITY.

A contract has been granted the Keystone Bridge Company, by the Louisville and Nashville Railroad Company, for the erection of a very large bridge across the Ohio River at Henderson, Ky. The channel span is to be 525 feet in length. Eight spans each are to be 250 feet long, and five spans each 120 feet in length, with a trestle-work approach. When complete, the bridge will be 3676 feet long, and require 3800 tons of steel and iron. The channel span will be the longest discontinuous straight-truss span ever built. The bridge will be for single track; the trusses will be on the triangular or Warren type. It is expected by the company that they will finish the contract by January 1, 1885. Work on some of the departments will be carried on night and day.

Thompson, Epping & Carpenter, of Pittsburgh, have recently shipped two of their large Epping vertical pumps to the Bellaire water-works. The pumps have a capacity of 2,000,000 gallons per day, and weigh over 25 tons each. They have also furnished two pumps of the same style to the Bellaire Nail Works and two to the Riverside Iron Works.

The steel-workers of Braddock have at last organized a co-operative store company, with a capital stock of \$20,000, \$5000 of which is paid up, the balance subject to call. John Hutson is president; W. Y. Williams, secretary, and J. A. Griffith, treasurer. The company will commence business at once.

The Negley's Run pumping station of the Pittsburgh water-works is to be supplied with natural gas as fuel. The coal has cost \$55,000 a year, including wages of extra firemen and the burning out of grate-bars, while the contract for gas was made at the rate of \$44,800 for the year.

The new foundry and machine shop in course of erection at the corner of First Avenue and Ferry street will be completed in a few days, and work will be resumed the latter part of next week. The building is of brick, 164 x 67 feet, and is three stories high. It is being built by Mr. Robert Lea, one of the oldest marine-engine builders in the city. The building which stood on the site of the new structure, and which was torn down last week, was occupied by Mr. Lea for 30 years. It was one of the old land-marks of the city, having been erected in 1830. This building has an interesting history, having escaped the great fire of 1845. The fire originated just across the street from the old machine-shop, and, although it ignited several times, it was saved from destruction.

Mr. Lea leased the building in 1854, and began the manufacture of steamboat machinery. The works have been in operation almost constantly since that time, and have furnished employment to hundreds of men. At the time work was suspended, three or four weeks ago, 70 men were employed. Several of these were given work on the new structure. This firm has a number of orders which cannot be filled until the new building is completed, and the work has been pushed rapidly forward.

MARYLAND.

On the 8th inst. the steamship Sardinian, which sailed from Baltimore for Liverpool, England, took out for Birmingham, England, a large bell, manufactured by Henry McShane, of Baltimore. Hitherto this country has procured its best bells from Europe. This appears to be reversing the order of things.

OHIO.

A meeting of the stockholders and leading creditors of Brown, Bonnell & Co., of Youngstown, was held in Cleveland on the 5th inst. Paul Wick, of Youngstown, and William McCreery, of Pittsburgh, were appointed a committee to prepare a proposition to be submitted to the creditors. It is proposed to form a new corporation, known as the Brown-Bonnell Iron Company, the creditors to receive the full amount of their claim in stock in the new concern or 50 cents on the dollar in cash. The creditors are to express their desires before April 20. It is believed that the proposition will meet the approval of the creditors, and that in a short time the 2000 employees will be at work.

The Dayton Screw Company have increased their capital stock from \$250,000 to \$300,000.

Billings, Taylor & Co., paint and varnish manufacturers, of Cleveland, have just completed, as an addition to their works, a two-story building 30 x 50 feet, to be used as a packing-room. They are running their works four nights each week until 10 o'clock, to keep up with orders.

Lodge, Barker & Co., Cincinnati, manufacturers of lathes, machine tools, &c., have just placed in their works two Whitcomb planers with 36 x 36 inch and 16 x 16 inch beds, one Pond planer 26 x 26 inch bed, one Davis key sealer, one Grant & Bogart grinding machine, and have ordered one Brainerd gear cutter. Among the machinery shipped last week were two 26-inch swing 25-foot bed engine lathes, to Jackson, Mich., one to Lexington, Ky., and one Fox monitor lathe to San Francisco for the Government. They are building for the trade a new 24-inch shaper embodying new features and principles, and state that business is good.

Geo. A. Gray, Jr., & Co., of Cincinnati, have just received orders for six of their "Universal" and "Radial" drills. Among their recent shipments were one "Universal" drill to Delaware, one "Radial" to Maine and one "Radial" for a local firm.

The Fitzmorris & Smith Foundry Facings and Supply Company, of Cincinnati, will erect an extension to their present works 75 x 100 feet. Among their recent shipments they report one carload to Phillips & Buttorf Manufacturing Company, Nashville, Tenn., one car to Chattanooga Foundry and Pipe Works, one carload to the Shickel Harrison Iron Works, St. Louis, one carload to the Kingland & Ferguson Manufacturing Company, St. Louis, and one carload to the Buckeye Engine Company, Salem, Ohio.

The Long and Allstatter Company, of Hamilton, are erecting an extension to their present works 50 x 50 feet, and adding to their main building one story 150 x 50 feet.

The Hunter Sifter Manufacturing Company, of Cincinnati, are placing in their factory a new 30-horse-power engine and boiler, and additional machinery, for the purpose of increasing the facilities for manufacturing their specialties.

The 8 and 9 inch guide mills of the Union Rolling Mill, at Cleveland, started up again on Monday last. The bar and puddle mill departments are expected to resume on Monday next. The mill was burned on December 9, and is at last in operation again, with the plant greatly improved and the company's books full of orders.

The old Ahkanna rolling mill, above Steubenville, operated some time ago by Sharpe & Daniels, and more recently incorporated as the Steubenville Iron Works, was offered at sheriff's sale on April 1, but was not sold for want of bidders. The property is appraised at \$35,000.

A new engine and set of boilers have recently been put in at Akron Furnace, at Brighton, belonging to the Columbus and Hocking Coal and Iron Company. The engine replaces a smaller engine, which has been transferred to Winona Furnace, belonging to the same company. These two furnaces now have two engines each.

ILLINOIS.

The Chicago Forge and Bolt Company's Works are situated at the junction of the river and railroads at South Chicago. The works cover three acres of land, employ 150 hands, and manufacture car axles, all kinds of heavy forgings, and bolts and nuts of every description. They have been running night and day for three years, and are full of work at present. This company are also proprietors of the Shumway & Burgess Bolt Company, in Chicago, engaged in the manufacture of bolts, nuts and all kinds of light forgings.

The Chicago Automatic Lock and Brass Manufacturing Company, of Chicago, lately incorporated concern, with a capital of \$10,000, for the manufacture of Crane's patent automatic lock and other hardware specialties, report business good. This company intend placing on the market soon a new lock styled the three-quarter long-shot lock.

The Wolff Manufacturing Company, of Chicago, are breaking ground at the corner of Jefferson and West Lake streets for an extensive addition to their plant for the manufacture of plumbers' supplies. The structure will be of brick, five stories and basement, and will furnish employment to 200 more men. The first floor will be used

as a storeroom, second, third and fourth for their brass-shop, and the fifth as a foundry. In this foundry will be placed a cupola of their own make, having a capacity of 20 tons a day. Several thousand dollars' worth of additional machinery will be added, and the company expect to have this important addition to their works in running order by September 1.

The Decatur Iron Felloe Wagon Company, of Decatur, lately incorporated, with \$100,000 capital, are moving into an extensive building, putting in special machinery, &c., with the expectation of commencing the manufacture of their patent wagons within a very short time. They expect to turn out 10 to 15 wagons per day at first. They bought the property of the Decatur Woolen Mill Company, whose machinery has been removed and partly sold.

Nicol, Burr & Co., of Peoria, have just finished a machine shop, 180 x 50 feet, and a foundry building of the same size, as well as recently constructed a four-story building for their valuable patterns, of which they have a very large stock. They have remodelled all of their machinery, making it as good as new. Their largest lathe swings 13 x 4 feet, and their equipment includes compound lathes and boring machines, and everything of the most complete character. The firm report good business.

The Blakeslee Manufacturing Company, Du Quoin, will probably erect a new foundry and put in several lathe and drill presses. They report that prospects are good.

The Brown Bros. Manufacturing Company, of Chicago, have increased their foundry facilities by taking possession of the old Livesey Iron Works, Quincy street. These works are 80 x 80 feet in size, and will be at once thoroughly equipped.

In order to increase their facilities for the manufacture of truss-rods and other iron forgings, Godey & Strom, of Chicago, have made arrangements for adding to their plant a large amount of new machinery, including punches, shears, lathes, &c.

INDIANA.

Brazil Furnace of the Central Iron and Steel Company is banked up on account of a strike among the miners of the company.

MICHIGAN.

The E. T. Barnum Wire and Iron Works, Detroit, have just completed a \$100,000 plant in Detroit, and will build a new factory in Windsor, Ont., this spring, and put in several new and improved steam looms for wire lath cloth and wire malt-kila floors by power. The prospects are very good. At their annual meeting, February 1 (the end of their fiscal year), their statement of business showed 35 per cent. increase over the previous year's business.

The business of the Detroit Malleable Iron Company has taken a very satisfactory turn. They are now turning out a variety of beautiful and uniform castings, said to be unsurpassed in quality. The works are under the supervision of F. H. Simpson, formerly assistant superintendent of the malleable-iron department of the Champion Reaper Works, at Springfield, Ohio. This company have produced draw-bars of malleable iron weighing 100 pounds, which are much lighter than the gray-iron bars, and yet much stronger. The works are running on full time, and will be enlarged to meet future demands.

Vulcan Furnace, at Newberry, is out of blast again, and undergoing certain repairs and alterations calculated to insure better results than have been obtained hitherto, the stack not working to the best satisfaction of the management. The changes contemplated will be made in a few weeks, when the furnace will again start up. Meanwhile, the force of men employed in and about it will be held intact, as there is plenty to be done about the plant to keep them busy while the furnace will be idle.

Houghton hopes for an iron roller mill and Bessemer steel works.

The Detroit Steam Radiator Company, of Detroit, are shipping to Chicago 8000 feet and upward—heating surface—of their patent radiators for the new Pullman building. The order for this building in all is for about 25,000 feet. They are also filling a large order for the new Commercial Bank building, Chicago.

KENTUCKY.

Mount Savage Furnace, in Carter County, has been out of blast since January last, and will remain so for the balance of the year. It will probably make a blast in 1885.

A portion of Swift's Iron and Steel Works, at Newport, is shut down on account of an attempted reduction of the wages paid to coal heavers, the men having received \$9 per week, which the management wished to reduce 10 per cent.

VIRGINIA.

The stoves which have been in course of erection at the Gem Furnace, belonging to the Shenandoah Iron Company, at Milnes Station, on the line of the Shenandoah Valley Railroad, have been completed and the furnace put into blast. It is expected that the improvement will enable the furnace to increase its output to 90 or 100 tons per day.

The large furnace of the Crozer Steel and Iron Company, at Roanoke, which has been undergoing repairs for the last month or two, will go into blast about the 17th inst.

GEORGIA.

Cherokee Furnace, at Cedartown, will continue her present blast on charcoal until about June 1, when she will be blown out and general repairs made. When ready to blow in, the management expect to make a trial of the new broken Arrow coke, for which so much is claimed, and, if the experiment proves successful, will probably use it entirely during their next blast.

Representatives of 50 Southern cotton mills met at Augusta on the 3d inst., to take action on the evident overproduction of cotton goods. The details of a plan of concerted action to regulate production and control the market was left to a committee of 15, and also the formulation of a plan of organization and constitution for a Southern

and Western Manufacturers' Association, whose object and purpose shall be of the same general character as the New England Manufacturers' Association. H. H. Hickman, of the Graniteville Factory, Augusta, is chairman of the committee, and Wm. E. McCoy, of the Riverside Mills, Augusta, is secretary.

TENNESSEE.

The South Tredegar Iron and Nail Company have purchased the keg and barrel factory of the Chattanooga Cooperage Company.

Warren Furnace of the Warren Iron Company went out of blast on December 19 last, after a run of a little over nine months. During this time the furnace made 10,783 tons of pig, the best month's work being in July—1442 tons; and the best day in December—65 tons. From 45 to 50 per cent. brown hematite ores were used, and the whole blast was made on almost cold blast, but from 150° to 200° being allowed at any time. The iron is excellent wheel iron and gives a good chill.

LOUISIANA.

The contract for roofing the World's Industrial and Cotton Centennial Exposition building at New Orleans has been awarded to the Cincinnati Roofing Company over 24 competitors. The roof is to be covered with their patent inter-lock joint roofing, and to be painted with their "A A" roofing paint. They also have the contract for roofing the elegant Horticultural Building being erected by the Exposition. In connection with the roofing of the main building, this aggregates about 34 acres of roofing.

ALABAMA.

The Bibb Branch Coal and Coke Company, at Birmingham, owning the celebrated Morrow mines, are opening up a 3-foot vein of very superior coal, and are making an output of 300 tons per day.

There is a movement on foot to establish locomotive works capable of turning out 125 engines a year, at Anniston. It will require about 400 men to operate them. It is claimed that there is abundance of water, iron, coal and wood at hand, while steel boiler plates only will have to be shipped from the North.

CALIFORNIA.

The Risdon Iron Works, of San Francisco, are noted as having turned out some very heavy work, among other things having manufactured the Virginia City water-pipe, and the pumps of the Chollar, Norcross and Eureka Consolidated mines. The Risdon Iron Works make a specialty of machinery for mines, steamships and sugar mills. The hoisting apparatus of the Yellow Jacket Mining Company, used to hoist ore from a depth of 4000 feet, and weighing 350 tons, was made at the Risdon Iron Works, and is claimed to be the heaviest machinery of its kind ever made. In order to handle the enormous weight of the pieces of machinery manufactured in its shops, the works have a revolving crane capable of lifting 50 tons, with 12 hydraulic side cranes.

One of the largest iron works in San Francisco is the Fulton Iron Works, founded in 1855 by D. B. Hinckley, and at present owned by D. B. Hinckley, James Spiers and D. E. Hayes. They now have 250 to 300 persons constantly in their employ. Three large cupola furnaces capable of melting 40 tons of iron per day consume yearly about 3500 tons, of which 2500 tons are imported from Scotland, and the remainder is obtained at home. They are sole agents on the Pacific coast for the Deane steam pump, and manufacture to order the Corliss steam engine. They also make quite a specialty of marine engines of all sizes, besides iron and steel boilers. They have on hand at present some nine orders for engines and boilers for steamships and saw-mill plants, besides a number of other miscellaneous orders.

Prescriptive Right to a Water-Power.

The following interesting case has been adjudicated by the Pennsylvania courts: Solomon Gebman is the owner of a mill on a small creek in Center Valley, in Lehigh County, and Enos Eidman and Jacob Geisinger are the owners of another mill on the same creek, some distance further up the stream. The latter complained that the mill-dam of the lower mill was so constructed as to cause the water in the creek to back up at certain periods upon the water-wheel of the upper mill and impede its action. Messrs. Eidman and Geisinger commenced suit in the Common Pleas of Lehigh County against Mr. Gebman, to obtain redress for their grievances. At the trial it appeared that both mills had been owned by John Romig, who sold them in the year 1815 to Christian and Peter Young, who in the same year, by amicable proceedings in partition, divided the property, Peter Young taking the upper mill and 42 acres of land, and Christian Young the residue of the tract, including the lower mill and the water-course. The present owners derive title from this source. In 1843 a freshet destroyed the lower dam, and before it was rebuilt a former parol understanding as to the right of water was reduced to writing, and a certain stone in the stream named as a water-mark, the water not to be allowed to raise to a depth of more than 4 inches above it. The dam was constructed and has not been altered up to the present time. The defendant practically admitted that the agreement had been made, but held that, the dam having been built and the easement enjoyed for more than 21 years, he had obtained a right by prescription. The court below charged the jury that if the defendant for a continuous period of 21 years had maintained a height of water of more than 4 inches over the stone or water-mark, his right was established. The jury found for the plaintiffs, and the defendant removed the case to the Supreme Court. It has just been held by that court, in an opinion by Clark, Justice, that the lower court erred in adopting the changeable height of water over the stone as a standard, and should have charged the jury that if the dam or obstruction had been maintained for more than 21 years at its present height, the right by prescription to enjoy the easement was established.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, April 17, 1884.

DAVID WILLIAMS, Publisher and Proprietor.
JAMES C. RAYLES, Editor.
JOHN S. KING, Business Manager.

RATES OF SUBSCRIPTION, INCLUDING POSTAGE.

THE UNITED STATES, BRITISH AMERICA AND
HAWAIIAN ISLANDS.

Weekly Edition.....\$4.50 a year.

semi-Monthly Edition.....\$2.30 a year.

Monthly Edition.....\$1.15 a year.

Issued the FIRST THURSDAY of every month.

TO ALL OTHER COUNTRIES.

PER ANNUM, POSTPAID.

Weekly Edition: \$5.00—£1.25 francs—30 marks—12

semi-Monthly Edition: \$2.50—£1.25 francs—12

Monthly Edition: \$1.25—£1.25 francs—12

REMITTANCES

should be made by draft, payable to the order of

David Williams, on any banking house in the United

States or Europe; or, when a draft cannot be ob-

tained in postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS

In any part of the world may obtain *The Iron Age*

through the American News Company, New York,

U. S. A.; the International News Company, New

York, U. S. A.; and London, England; or the San Fran-

cisco News Company, San Francisco, Cal., U. S. A.

RATES OF ADVERTISING.

One square (12 lines, one inch), one insertion, \$2.50;

one month, \$7.50; three months, \$15.00; six months,

\$25.00; one year, \$40.00; payable in advance.

BRITISH AGENCY.

Office of THE IRONMONGER, 448 Cannon St., London.

DAVID WILLIAMS, Publisher,

33 Reade Street, New York.

PITTSBURGH.....37 Fourth Avenue.

PHILADELPHIA.....320 South Fourth Street.

CHICAGO.....35 & 38 Clark St., cor. Lake.

CINCINNATI.....13 West Third Street.

CHATTANOOGA.....Eighth and Market Streets.

SOLE AMERICAN AGENCY FOR

THE IRONMONGER.

Published at 448 Cannon St., London.

The oldest and leading representative of the British

iron and hardware trades.

Subscription, Postpaid.....\$5.00

to countries outside of Great Britain, including

Monthly Foreign Supplement of one copy of Iron-

monger's Diary.

By a mutual clubbing arrangement between the

two journals, subscriptions to both will be received

by either *The Ironmonger* or *The Iron Age* on the fol-

lowing terms:

THE IRONMONGER AND THE IRON AGE, Weekly.

In the United States and Canada.....\$7.50 or £1.25

In Great Britain and Ireland.....5.00 or 1.25

In other countries.....5.00 or 1.25

THE IRONMONGER, Weekly, and THE IRON AGE,

Monthly.

In the United States and Canada.....\$7.50 or £1.25

In Great Britain and Ireland.....5.00 or 1.25

In other countries.....5.00 or 1.25

The Western Nail Pool.

The Western Nail Association at its meet-

ing held last week, a synopsis of the action

of which was telegraphed and appeared in

our last issue, took steps for the formation

of what is generally known as a "pool."

The full details of the arrangement then en-

tered into by those present have not been

made public. It is understood, however,

that the agreement then drawn up and

signed provides virtually for placing the

Western factories in the hands of a Board of

Control. The West is divided into four dis-

tricts—one including Pittsburgh and the

Mahoning and Shenango valleys; the sec-

ond, Wheeling and vicinity; the third, the

mills in the neighborhood of Chicago and St.

Louis, as well as the Indiana mills; and the

fourth, the mills of the Ohio River below

Wheeling. Each of these districts elects two

members of the Board of Control, and these

eight, with the president of the association,

form the board. This board has power, sub-

ject, of course, to approval and the direction

of the association, to regulate the production

and price of nails. All sales are to be made

through agents appointed by the Board of

Control and subject to their orders, though

the nails sold will be shipped direct from the

factories. The agents will collect and remit

to the factories from which the nails are de-

duced. This will prevent all possibility of

does not by any means exhaust the catalogue
of industries that are pooled, but it indicates
somewhat the character of those which are
entering into arrangements that half a score
of years ago were regarded as economic
heresies that were past forgiveness.

There is nothing to be gained in dealing
with this fact of combination by hurling at it
the dogmas of the political economy of a
century ago. Whether, for good or for evil,
combinations exist in trade to a greater ex-
tent than some years ago it was believed to
be possible, and the tendency is to a still
greater increase. Modern industrial life has
been marked by enormous aggregations of
capital and the carrying on of manufactur-
ing on an extensive scale. The little estab-
lishments of past centuries, where manufac-
turing was conducted in the house of the
master workman, he being assisted by his
apprentices, all living under the same roof,
have disappeared from among the industrial
nations of the world, and their places have
been taken by enormous factories and estab-
lishments that are the outgrowth of modern
methods. It certainly looks as if these mon-
ster works were in turn to be supplanted or
absorbed by combinations still more gigantic.
The individual mine passes with a score of
other mines under the control of one corpora-
tion; the oil refiners scattered up and down
the Allegheny and through the oil regions
pass under the control of the Standard Oil
Company; the tack factories of the country
are controlled by one central company; the
Nail Association is attempting to reach the
same result. This is the tendency of modern
industrial life. It must be accepted as a
fact, and whether it be for good or evil will
depend upon the wisdom of the parties to
such combination.

Peripatetic Iron Works.

We observe in an exchange a rumor that
several of the Hocking Valley blast furnaces
are to be removed from their present loca-
tions to Buchtel, thus making that place the
iron center for the district. If the reported
removal is effected, it will be quite a notable
event in the line of the removals of iron
works. This announcement recalls quite a
number of similar occurrences which have
taken place in the past decade. Blast fur-
naces and rolling mills are usually such
massive structures, taking their entire plant
into consideration, that they seem built to
stay; yet numerous instances have occurred
in which they have been taken to pieces and
removed a long distance from their original
location. The State of Indiana has lost a
number of furnaces in this way. About
1867 a movement was inaugurated to utilize
the block coal of the Brazil district of
Indiana in the manufacture of pig iron, and
several furnaces were erected in that year
and in the few years immediately succeed-
ing. But the district was evidently too far
from deposits of good iron ore, and the fur-
naces gradually ceased operations, until
within the past four or five years only two
or three furnaces have been making any
pig iron in the State. A number of the fur-
naces have been dismantled, and their ma-
chinery is now in operation in other States
where the manufacture of pig iron can be
more profitably prosecuted. The Western
furnaces, at Knightsville, were in this way
transplanted to Cleveland, Ohio, and one of
the Vigo furnaces, at Terre Haute, reappears
in Alabama. The removal of the Vigo fur-
nace to Alabama is, we believe, the longest
journey made by any blast furnace.

When the Hocking Valley of Ohio excited
sanguine expectation of the cheap manufac-
ture of pig iron, in 1874, new furnaces were
undertaken in that district and old ones
were removed to it. The Kenton Furnace
had stood inactive for several years at New-
port, Ky., and it was purchased and removed
to Greendale, Ohio. Another furnace was
removed into the district from Akron, and a
third furnace was taken thither from Colum-
bus. The Fannie Furnace No. 1 was built
at Newark, in the Hocking Valley, but was
only blown a year, after which it was re-
moved to a new location, at Shawnee.

The Escanaba Furnace was built at Escanaba, Mich., by Pittsburgh capitalists, who
shortly afterward failed. The furnace stood
idle for several years, when it was at
length purchased by the Edgar Thomson
Steel Company, and transformed into their
famous Furnace A at Pittsburgh. The Prin-
cess Furnace was erected near Ashland,
Ky., to take the place of the well-
known Buena Vista Furnace, but the new
venture proved unsuccessful, and now, after
an idleness of several years, it is being es-
tablished in a new locality in Virginia. The
old Elizabeth Furnace, at Niles, Ohio, was
removed to Youngstown, in proximity to the
rolling mill of its purchasers, the Mahoning
Valley Iron Company. A furnace was
erected at Richland, Wis., but the de-
posit of iron ore proved to be unsatis-
factory, and not long afterward the works
were removed to Michigan. Scotch capital
was invested to a large amount in the
erection of two furnaces at Port Washington,
Ohio, which made an unprofitable return
for the amount they cost, and they were
sold to Pittsburgh parties, who have recently
built a furnace on the Monongahela River
with the material.

Rolling mills have not been so prone to
wander as blast furnaces, yet they have
occasionally changed their locations. One
we know of which made a jump from Dan-
ville, Pa., to Colorado, and then moved from
one part of that State to another. The old
rolling mill formerly at Paducah, Ky., is

now running at Riverside, near Cincinnati.
Another rolling mill which was at one time
an institution of Danville, Pa., is now located
at Chester, in the same State. The rolling
mill which once employed a goodly number of
men at Jackson, Mich., is now a part of the
mill at Springfield, Ill. A rail mill originally
erected at Decatur, Ill., was afterward
taken to Rosedale, Kan. A rolling mill and
nail factory were built at Dunleith, Ill.,
which are now to be found at Omaha, Neb.
A notable removal in England was that of
the great steel works of Charles Cammell &
Co., which were taken last year from their
old location, at Sheffield, and removed to
Workington, nearer the coast, to secure
better export facilities.

Our Exports of Gold.

Although the foreign exchange market
has lately been very quiet, the exports
of gold continue on a large scale. This
naturally causes much comment, and finan-
cial authorities are seeking to account for it.
Some suppose that a "short interest" exists
in sterling in consequence of sales made some
time ago by bankers of their own bills, in
anticipation of a larger movement to Europe
of produce than has taken place, and that
these bankers are now covering by sending
gold. Others argue that such a theory would
not account for the whole of the shipments,
as they aggregate such a very considerable
sum, and that there must be a cause which
extends further and affects a wider range of
interests. American securities are held
abroad to a considerable extent, but dividend
and interest payments will not account for
the specie shipments now being made. Oc-
casional resales of such securities are made
in this country, but there has been no large
importing of our securities from foreign
holders in sufficient volume to warrant the
payment of so much gold. Nor, finally, does
there seem to be a balance due other coun-
tries on account of merchandise imported, as,
according to the Government reports, our
total monthly exports of merchandise have
exceeded in value the imports of merchan-
dise since last July, the excess in the value
of exports over imports for the first two
months of the present year having been
\$26,283,137. The statement for March has
not yet been published, but, even if the im-
ports for that month overbalanced the ex-
ports, the difference cannot be great. In
the eight months ended February 29 the
value of the exports of merchandise ex-
ceeded the imports by \$88,299,893. Now,
with such a favorable balance as this in our
favor, why, if the Government statements
are correct, should we not be importing gold
instead of exporting it, as we have done
lately, at the rate of from \$1,000,000 to
\$2,000,000 a week?

The great leak in conducting our inter-
national trade is in the ocean freight ac-
count. Here is the channel which absorbs
many millions of dollars annually, the pay-
ment of which does not appear in Govern-
ment reports except indirectly, and these
vast sums are almost totally lost to this
country, because they go mainly into the
pockets of foreigners. So long as the United
States lacks a mercantile marine sufficient
in extent to compete with European coun-
tries for the carrying trade of the ocean she
will have great difficulty in maintaining
her position as a creditor nation. We may
ship large quantities of wheat and cotton
and provisions to other countries, and se-
cure an apparently large balance in our
favor, but the enormous sums we are
obliged to pay to foreign shipowners for
freight on those exports and on our imports
will absorb a large part of the balance,
thereby causing the shipment of gold abroad
when it should be flowing this way.

The Congress of the United States is
derelict to its sworn duty in not endeavoring
to cure this unfortunate state of affairs.
Well-considered and highly-approved mea-
sures have been perfected in the Shipping
Committees of both branches of Congress,
but no time can be found for their considera-
tion. Four months of the session have
passed, and the appropriation bills and other
routine business should have been out of the
way long before this time, giving ample
opportunity for the deliberation of some plan
by which the American merchant marine
could be restored to its lost supremacy,
which is a subject of infinitely greater im-
portance than the erection of public buildings
in small interior cities, or the adoption of a
scheme to promote education, over which
Representatives and Senators can spend days
of valuable time. This legislation is of
vastly greater immediate importance than
the reduction of the surplus in the national
treasury, upon which so many mighty intel-
lects are pondering, and for which so many
plans have been formulated. At the same
time a little of the troublesome surplus might
be used very judiciously in this direction,
where it would accomplish much more prac-
tical benefit than in being dribbled out in
small sums to the various States to support
an educational chimera. It is perhaps vain
to look to this session of Congress for any
practical legislation of this sort, as the Presi-
dential and Congressional elections are
approaching, and only sentimental or politi-
cal legislation will probably be attempted,
but we hope that a few Members of Congress
are so impressed with the importance of this
subject that they will not cease to push it
along actively until that body is compelled,
through sheer desperation, to take up and
dispose of it.

Wages in the Western Iron Trade.

The preliminary steps for the usual discus-
sion concerning wages in the Western iron
trade have already been taken, and a meet-
ing of the committee of workmen and manu-
facturers charged with the settlement of this
question will occur at no distant date—per-
haps this week. The scale convention of
the Amalgamated Association, which has the
decision of the demand that shall be made
upon the manufacturers, held its session in
Pittsburgh on the 5th of April. The result
of this meeting has been guarded with a
great deal of care, but it seems quite certain
that there was considerable difficulty in
reaching a conclusion as to the form of the
scale that should be presented for the ensu-
ing year. A portion of the delegates fa-
vored a reduction in the scale to a 2-cent
basis, which would make puddling \$5, and
other work about 10 per cent. less than at
present. This was very hotly opposed, how-
ever, and it is given out that the last year's
scale will be presented to the manufacturers,
with some changes regarding the rolling of
mild steel.

Whatever may have been the result of the
State convention, there can be no doubt that
there is a decided feeling among a large por-
tion of the iron workers of the West that
there should be some reduction of
wages. It is believed the condition of trade
makes it a necessity, and at the same time
that it can hardly be expected that they will
concede such a reduction unless they see
that the manufacturers are in earnest in
demanding it. Like all other human beings,
they are willing to take all they can get,
and this is a characteristic with which no
one can find fault. We believe sincerely
that the result of the discussion regarding
wages between the manufacturers and the
workmen depends entirely upon the action
of the manufacturers themselves. If they
are firm, determined and united in asking
for a moderate reduction they will get it; if
they show any weakness, or any foolish
attempt is made by those of one section to
profit by the stoppage of another, they need
look for no reduction. It is beyond ques-
tion that the Amalgamated Association is
neither so strong nor so united as it has been
in the past, and if the manufacturers fail to
get a reasonable reduction of wages the
present year, they will be defeated by their
own weakness and not by the strength of
their opponents.

Quality Grades Instead of Brands in the Tin-Plate Trade.

We imagine that one of the greatest diffi-
culties which importers and dealers in tin
plate encounter when considering the ques-
tion of quality grades to take the place of
brands is a schedule or list of the qualities
that are really demanded for the purpose.
The difficulty appears greater, perhaps, than
it really is, growing out of the lack of spe-
cific descriptions of requirements upon the
part of consumer, and also out of the large
number of brands from which to select in
order to supply the consumer's supposed
wants. Yet a very little reflection must
show that there are several well-defined
classes into which tin plates are practically
divided, whether grade qualities are named
or not, and it would be a comparatively
simple matter to devise for them such a set
of designating quality terms as would be
entirely appropriate.

An important step toward the intro-
duction of this feature of business, for which
possibly the trade is not yet fully prepared,
although it is making rapid strides in that
direction, is the mutual knowledge of each
other's position growing out of the con-
ferences between importers and consumers
and the exchanges of opinion incident to the
guarantee system as at present practiced.
By the very force of circumstances jobbers
are beginning to know the plates they
handle as meeting certain requirements, and
they are already classifying them for their
own private purposes according to their real
qualities. Plates meeting the requirements
of ordinary tinshop work for making assort-
ment ware, for example, form one class;
those making an average roof form a second,
while the very best for roofing purposes, and
the cheapest that can with safety be em-
ployed in such work make the third and
fourth; a fifth may be of such plates as
canners use, and a sixth the extra-deep
stamping plates. Still other classes naturally
suggest themselves. It is hardly worth
while to argue the question of quality classi-
fications, for plates are so classified now that
the first thing said about a new brand when
it is mentioned is that it belongs to plates of
such and such a quality, or is equal to some-
thing already known. Sales to stampers
and to canners are at present made based
upon quality, irrespective of brands, and only
a slight advance is needed to bring sales to
the average consumer to the same line.
Brands hold their position in the minds of
the trade by reason of some supposititious
value which they do not possess, or else
because they form one of the nothings in
trade which it is well to have around to talk
about. It is certainly true that they are so
used in many cases.

The best interests of all concerned in the
tin-plate trade demand the abrogation of
brands as designations in sales, and the sub-
stitution of definite quality specifications so
precise in terms that no one need doubt
their meaning. Tin plates of clearly defined
qualities sold with a guarantee that they are
exactly as represented, irrespective of their

brands, is the legitimate consummation of
the reform in the tin-plate trade. The
object is to give such goods as are wanted
for specified purposes, and to guarantee
good faith at every stage. Brands have
been the convenient instruments of decep-
tion in the past, and are stumbling-blocks at
the present time, and there is no excuse for
their further employment in dealings with
consumers by houses who desire to command
the respect and confidence of their customers
to the utmost. That firm which first seizes
upon this idea and reduces its business to
such a basis as will enable it to sell plates
upon quality specification, fully guaranteed,
will achieve a success to which its past
record, however brilliant, affords no paral-
lel, and if it is wise in the management of
this business it will make no announcement
of the brands it handles, for reasons too
obvious to need explanation.

The Outlook for Tin Plates.

When toward the close of February last
we wrote editorially on the subject of tin
plates, the average price of ordinary brands
had declined to the lowest level reached in
this market during a decade, for it was then
\$4.98, as the table below will show:

PRICE OF TIN PLATES IN NEW YORK.			
1879.			
January.....	\$5.35	July.....	\$5.50
February.....	5.70	August.....	5.40
March.....	5.75	September.....	5.57
April.....	5.67	October.....	6.66
May.....	5.66	November.....	7.38
June.....	5.48	December.....	7.11
1880.			
January.....	\$6.11	July.....	\$5.40
February.....	5.70	August.....	5.70
March.....	5.68	September.....	5.78
April.....	5.80	October.....	5.16
May.....	6.75	November.....	5.40
June.....	5.83 1/2	December.....	5.39
1881.			
January.....	\$5.32	July.....	\$5.42
February.....	5.82	August.....	5.52
March.....	5.87	September.....	5.47
April.....	5.87	October.....	5.32
May.....	5.37	November.....	5.82
June.....	5.42	December.....	6.25

PREVIOUS PRICES.

July 1, 1874.....\$8.71 February 28, 1878.....\$5.66

April 30, 1878.....6.58 March 31, 1878.....5.66

May 5, 1877.....5.97 April 30, 1878.....5.72

September 7, 1877.....6.00 May 31, 1878.....5.37

October 19, 1877.....5.97 June 15, 1878.....5.33

December 30, 1877.....5.25 July 15, 1878.....5.33

December 31, 1877.....5.77 October 31, 1878.....5.18

January 1, 1878.....5.75 December 18, 1878.....5.28

The lowest price which coke tins reached
last year was \$5.05; in 1882 they also tem-
porarily dropped to the same figure. In
February of this year they declined to \$4.60
to \$4.75. Since then a rebound has set in,
coke tins leading the market, and recovering
to \$4.80 to \$5.12 1/2 early in April. The im-
port last year was 493,380,745 pounds, less
re-export 1,666,792, leaving a net import of
491,713,953 pounds, or 219,515 tons of 2240
pounds, against an import in 1882 of 479-
330,665 pounds, less re-export 2,654,736
pounds, leaving a net import of 476,675,929
pounds, or 212,802 tons. The increase of
supply by importation during the twelve-
month was therefore only 3 per cent; yet
the long and severe winter and consequent
slack demand caused the unprecedented
depreciation we have witnessed.

Meanwhile stocks have run low, both in
the interior and in port, and with the return
of fine weather and the demand for building
purposes, coupled with revival of the can-
ning industry, the market has gradually
taken an upward turn, with a fair prospect of
developing further activity and strength as
the warm season approaches. Dealers in
Liverpool and makers in Wales are fully
aware that the situation on this side at
prevailing low prices is very sound, and that
with abundant crops we are likely to con-
sume more tin plates this year than ever
before.

A telegram from England last Saturday
stated that, owing to the depression in Eng-
lish shipping, 10,000 laborers are out of work
in the Tyne shipyards, and as many more in
the Sunderland shipyards, while business is
slack along the Clyde. A hundred steamers
are lying idle upon the Tyne, and in Shields
there are 4000 seamen out of employment.
Other ports are crowded with destitute and
suffering sailors. This condition of affairs
shows how foolish is the belief that an entire
absence of duties will make trade steady.
We know in this country that, on the other
hand, high duties will not always keep our
people employed. The laws of supply and
demand are higher and broader than mere
legislative enactments. With no duties on
ships, British shipyards have for several
years past been crowded with work, as
though some powerful stimulus was operat-
ing in addition to the mere demand for ships
for ordinary purposes. With high duties on
competing products, American manufacturers
have for a few years been so bountifully sup-
plied with orders that a greater cause has
been sought for than the simple law of supply
and demand, and the tariff has been credited
with furnishing an unnatural stimulus which
led to the building of more manufacturing
than were needed. No general principle of
political economy can be deduced from the
ebbs and flows of the industrial tide which
sets legislative enactments at defiance. Yet
there are many of our casuists who main-
tain that the British shipbuilding industry is
depressed on account of free trade, while
others of the same school contend with equal
ardor that American industries are pros-
trated on account of too much protection.

The Philadelphia Gas Trust, now being
investigated by the city authorities, must
have been a profitable customer for the cast-
iron pipe manufacturers. On the 9th inst.
the remarkable fact was deduced that on

\$108,000 worth of pipe \$47,000 extra was charged the city, not only above the market price, but above the price at which the Trust was receiving other supplies. Of course, the profits on such a contract were wholly absorbed by the pipe manufacturers, the Gas Trustees who made the contract being guileless individuals and easily imposed on.

The British Iron and Steel Institute.

The May meeting of the British Iron and Steel Institute has been fixed for London, but it is still uncertain whether the autumn meeting will be held in this country or in Sheffield. The London *Ironmonger* says on this point:

Some time ago we mentioned that there was a possibility of the autumn meeting of this Institute being held in the United States. Since then certain informal negotiations are understood to have been in progress, with the broad result that an official invitation has now been received from the American Institute of Mining Engineers, suggesting a visit to the States in August or September next. The American Institute is the leading body of its kind across the Atlantic, and its membership includes almost all the principal scientists and metallurgists, so that there can be no question that it is fairly and fully representative of the country in which it exists. The mere fact of such an official invitation having been forwarded affords convincing evidence that the misunderstandings of a few years ago have been lost sight of and buried, so that there need be no hesitation whatever in dealing with the matter on its merits. As a proof of amity and good-fellowship the invitation is of high value, even if it should be considered impracticable to agree to the proposal this year. The American Institute, we have every reason for believing, would accord a hearty welcome to the British Institute, and would endeavor to make the visit pleasant and in every respect memorable. Whether the Council of the Iron and Steel Institute will or will not deem themselves able to hold the autumn meeting in the States we are unable to say at present, but we feel certain that a large number of the members would heartily support and endorse such a decision. In saying this we do so with the full knowledge that a statement is in circulation to the effect that the Council has already made up its mind to have the autumn meeting at Sheffield during the month of September. With the motives which have led to this decision—if decision it is—we are necessarily unacquainted, but we know of no general invitation having been forwarded from the Sheffield members or the local authorities; consequently, we may venture the supposition that the arrangement has been, or is being, influenced by a very limited number of gentlemen. That Sheffield would be an excellent and most suitable place for the gathering goes without saying, yet, as the autumn meeting is usually devoted to "fresh fields and pastures new," we cannot help thinking that the run across to the States would be more acceptable to the great majority of the members, pretty nearly all of whom may be assumed to know Sheffield already. Notwithstanding this opinion, which we know is largely held among the members, we feel certain that the choice of the Council, whatever it may be, will be approved by the rank and file, so to speak, of the Institute. If Sheffield should be selected there is no reason for doubting that the town and its manufacturers would give a hearty and hospitable reception to the Institute. If only for its busy manufacturing and industrial features, the town is worthy of being visited by the principal association of the day, while its attractive suburbs and the many seductive "outings" within easy reach ought to make the gathering a success in every sense of the word. With these alternatives before it, it is for the Council to decide on behalf of the general body. The States would probably be preferred by the majority, but, failing the acceptance of the American invitation, we have no doubt that Sheffield would be regarded as a capital substitute.

We are not aware that the invitation of the American Institute of Mining Engineers can properly be regarded as significant of any change of feeling on the part of the people of this country toward the people of Great Britain. We do not know that there have been any misunderstandings during the past few years, or ever, between gentlemen who represent the class of scientific and business men extending the invitation and the corresponding class in Great Britain to whom it was addressed. Englishmen distinguished as scientists, manufacturers or engineers have always been the recipients of distinguished attentions on this side of the ocean, and Americans entitled to recognition have been extremely well received in Great Britain and everywhere on the Continent. We should be sorry to have any one suppose that there once existed a misunderstanding which has been renewed, or that the invitation is to shake hands over the buried hatchet of an old-time contention or disagreement. The American Institute of Mining Engineers and the British Iron and Steel Institute are representative societies. They have together contributed in important and varied ways to the progress of knowledge in the arts and sciences relating to mining, metallurgy and mechanics, and the desire to bring these two societies together, that gentlemen of kindred tastes and pursuits may enjoy the pleasure of becoming acquainted under peculiarly pleasant auspices, sufficiently accounts for the invitation on the one side and the disposition to consider it favorably on the other. It is just as well to remember, however, that, should the British Institute come here this fall, there will be plenty of room for the bitterest ill-feeling on both sides before the visit is over if care is not taken to avoid disputes on questions, especially those of a politico-economic nature, with which neither of the institutes has anything to do. We shall be in the midst of a Presidential canvass in which it is probable the vital issue will be one likely to attract a great deal of interest in England. Incautious utterances on either side would provoke much bitterness. It will not be a good time for missionary effort, and, if it was so considered, the gentlemen who would be brought together at the joint meeting would not be the proper objects of such effort. We call attention to this danger, as grave fears have been expressed in this country that our English friends might, under the circumstances, both say and hear a great deal which had better be left unsaid, especially as our people

would be peculiarly sensitive to criticism at a time when every citizen is more or less excited over the issues of National politics. We hope such fears will prove groundless, and that, should our friends visit us, mutual courtesy and consideration will be manifested among gentlemen representing the two greatest technical societies of the English-speaking world.

Our English exchanges intimate that Mr. Isaac Lowthian Bell has been marked out for the honor of a baronetcy, and, therefore, that his friends among the iron manufacturers on both sides of the water will soon be under the necessity of dropping Mr. and substituting Sir. While in this country, in theory at least, such titles go for little and are not supposed to be of much value, still the most pronounced republican connected with the iron business cannot but feel gratified that one who has so signally benefited the iron trade should receive what in his country is considered a mark of such distinction. We shall congratulate Sir Lowthian Bell with the most cordial sincerity, and feel sure that our readers will join us.

The indefinite prolongation of the strike of the window-glass blowers in Belgium is having a decidedly beneficial effect upon the window-glass trade in this country. Eighty-eight of the Belgian furnaces are out of blast, and it seems certain that the blowers of Europe will refuse hereafter to make glass in July and August, as the blowers in this country have. Heretofore this has caused an advance in the price of foreign glass, and has assisted the American manufacturers in getting the prices established by the association. The furnaces of the West have only 2½ months longer to run before the usual stop for the summer, and this, with the possibility of labor troubles next fall, will materially assist in maintaining the present price, if not in causing an advance.

The Defects in Bessemer Steel Not the Fault of the Process.

The following letter may contain statements which are not new to those engaged in the manufacture of Bessemer steel, but the writer very plainly and forcibly explains the reasons why the product of the pneumatic process is not uniform. His strictures upon inefficient or careless workmen may not be undeserved, though we would be pleased to hear from others upon this subject. As the Bessemer process is pre-eminently the cheapest and most productive steel-making process, and it is obvious that other channels of consumption should be assiduously cultivated, now that the demand for rails is much under the capacity of our Bessemer steel works, it follows that no pains should be spared to make this cheap steel thoroughly reliable for every kind of work, including shipbuilding, bridge-work, boiler-making and all other sorts of structural purposes. We are aware that steps have been taken in this direction at some of our Bessemer steel works, but much still remains to be done to secure for Bessemer steel the general use to which it is destined:

To the Editor of *The Iron Age*.—Sir: Since the introduction of the Bessemer process of making steel, it has been condemned as being unreliable for the production of steel for the construction of boilers, bridges, &c. This may, in a general sense, be true, but is this the fault of the process or the fault of those in charge of the converting department? The average converting mill foreman or blower can usually tell when the carbon flame disappears from the nose of the converter, when he has a hot or cold heat, and how to keep the mill in reasonably good repair and get out a large product, which depends more on the workmen than on the foreman. To be a competent foreman or blower one must be able to tell when the carbon has been eliminated; to understand the effect of high and low temperature; of high and low blast pressure; the effect it produces on the iron when nearing completion; the effect produced by a high percentage of manganese in connection with high-blast pressure; by variable pressure in the blast when the blow is being completed; the effect produced by overblowing; the amount of manganese required to remedy the effect produced by an overblow; and also, if the carbon has been reduced sufficiently low to insure good results, he should be able to continue the blow and stop it when the iron has been sufficiently desilicized. Unless he has the above qualifications, and also understands the effect produced by the elements that must enter into and be a part thereof, as well as the effect produced by those that should not be present in the finished steel, I do not see how good results can be expected.

It is not my intention in this article to attempt to prove the possibility of producing Bessemer steel of perfectly uniform quality under all circumstances, but I do expect to show why better results are not obtained when using iron of the best quality. When the product is intended for the construction of boilers, bridges or other purposes where ductility and tenacity are required, it is necessary to select the best irons in the yard, if they are sufficiently low in phosphorus, sulphur, copper and all other elements not eliminated in the conversion. When the materials have been well and intelligently selected, the results should be and are good to a certain extent. The trouble does not appear to be the fault of the metallurgist so much as the blower, for we often find that the best irons have been charged into the converter with both good and bad results, which goes to prove that the iron and recarbonizer have been well selected; if they had not been, the product would all have been equally bad. So we are compelled to conclude that the difficulty lies with those in charge after the iron has entered the converter.

In running the direct process, where the silicon runs up to 4 and 5 per cent., it often

occurs that the silicon is so high that the carbon is eliminated before the silicon. If the blower cannot tell when the silicon has been eliminated, the chances are 99 to one that the product will be almost worthless. It is well known that in an ordinary blow, part of the oxygen of the blast, especially if the blast pressure be too high for the column of iron in the converter, passes through the iron in a free state, uniting with the carbonic oxide above the iron, the balance of which escapes through the nose of the converter, producing the carbon flame at that point, the disappearance of which usually indicates the end of the operation. This amount continues to burn within the converter all through the process of blowing. When the flame at the nose disappears, the carbon, so far as the eye and the spectroscopic can determine, seems to be entirely eliminated, but the fact is that the carbon has not been entirely removed, but continues to burn within the converter. Notwithstanding this, the converter is turned down and the operation stopped with from 5 to 10 per cent. of carbon remaining in the iron. This, however, does not prove detrimental to the quality of the steel, but if anything should prevent the free oxygen from passing through the iron, the blower, unless he knew the cause, would continue the operation as long as there was any appearance of carbon at the nose of the converter.

If manganese be present to the extent of 150 to 200 per cent., the spectroscopic will continue to show carbon bands until almost the last trace of carbon has been eliminated, and to all appearances the converter has been turned down at the proper time, but on making an analysis of the blown iron it will be found to have been overblown, as its further working will plainly indicate. This is undoubtedly caused by the large percentage of manganese oxide in the slag, which naturally lies on the top or surface of the iron. This manganese oxide, not having yet reached its highest state of oxidation, continues to take up the free oxygen that passes through the charge. There being no oxygen above the charge, the carbonic oxide continues to burn at the nose of the converter as long as there is any carbon in the iron; consequently, the blower continues the operation until the carbon flame disappears, the result being the overblowing of the iron just the length of time required to reduce the carbon from .05 and .10 per cent. to almost zero.

Hot charges are very often overblown in the same manner. This is caused by the high temperature of the iron (which naturally increases its affinity with oxygen), causing it to more fully take up the oxygen of the blast, thereby preventing it from passing through the charge in a free state, and uniting with the carbonic oxide above the charge. Much also depends on the intelligence and ability of the workman doing the teeming or pouring. He should understand temperature as well as the effect which slow and fast pouring has on heats of different temperatures, for I am satisfied that prolific cause of chipping, fast pouring, can be greatly remedied if the workman be a competent one. For instance, ingots cast from the top always crack more at the lower end than at the top in rolling. This is doubtless caused by the greater distance the steel has to fall, which causes it to carry more air down into the molten ingot, the oxygen uniting with the carbon of the steel, forming carbonic oxide, part of which rises to the surface, unites with the oxygen of the air, thus causing the bright flame at the top of the mold when being filled, the balance remaining in the blow-holes, caused by the rapid chilling of the steel when in a state of ebullition.

There are many other ways in which ignorance produces bad results, but those which I have given are the most prominent, and too often the prevalent ones. If the superintendent, metallurgist, blower and workmen are all competent, I assure you there will be no reason to complain of the reliability of steel produced by the Bessemer process.

S. McDONALD.

Braddock, Pa., April 12, 1884.

Foundry Hydraulics.

To the Editor of *The Iron Age*: The rule given by Mr. Radcliff, in the article published in *The Iron Age* a short time ago, for calculating the lifting pressure on the core of the pipe gives the pressure on the cope, including that on the core-barrel. The correct rule for calculating the lifting pressure on all cores, when surrounded by the metal, is the same as for the buoyancy of all liquids—the weight of the liquid displaced. In the example given, the core being 20 inches in diameter and 96 inches long, we have $20^2 \times 96 \times .7854 \times .26 = 7841$ pounds lifting pressure on the core-barrel. E. TROWBRIDGE.

NEW HAVEN, CONN., March 31, 1884.

The New England Nail Strike.

The nail strike has ended, says the Boston *Commercial Bulletin*. The nailers have come in at the reduced wages. The Weymouth, the Old Colony and the Wareham nailers applied for work Wednesday morning; the Fall River nailers are also in line. The strike lasted 12½ weeks, though the Fall River men have only been striking about two months, and though the men have been gradually going back during the last two and one-half weeks. There was never before such a general strike in the New England nail trade. Very few such foolish strikes were ever undertaken in any trade. As pointed out shortly after the beginning of the strike, the manufacturers could not fail to win. The reduction was necessary in order that the New England manufacturers might meet the competition of the Pennsylvania manufacturers. Even the reduced price which the nailers have finally accepted is higher than the price paid in Pennsylvania. The manufacturers have at no time during the strike been embarrassed to any extent. They have been able to supply their customers by purchases at the West, and to make a slight profit by it. From the manufacturers' standpoint the strike has been a positive benefit to the nail trade.

At the beginning of the strike, owing to the large production East and West, the trade was threatened with heavy overpro-

duction. An average month's production for the New England nail works is about 60,000 kegs. Taking into consideration the fact that the Fall River nailers have only been striking two months, and that in some of the factories the strike lasted only 10 weeks, the loss in production may be roughly estimated at 150,000 kegs. The market has, therefore, been relieved by just that number, and the New England market becoming somewhat bare of stock, an outlet has been furnished for the surplus Western nails. The overburdened state of the market may be seen from the fact that prices have declined since the beginning of the strike from \$2.85 for rod, per keg to \$2.65. Had the New England mills continued producing, the decline would have been double this. Stocks are now in a reasonable condition. A rough estimate would place the number of strikers at between 500 and 600. Their loss in wages will foot up around \$100,000, and their loss by the eating in of living expenses has been fully \$50,000 or \$60,000 more. The nailers are mainly intelligent men, but they did not act intelligently in regard to this strike. Had they examined the matter carefully they would have seen its folly. The nail strike furnishes a strong argument to workmen in favor of arbitration.

WASHINGTON NEWS.

(From Our Own Correspondent.)

WASHINGTON, D. C., April 16, 1884.

The correspondent of *The Iron Age* called upon ex-President Grant, during his last days in this city, and, in the course of an extended conversation, largely upon national issues and politics, the ex-President, referring to the tariff in politics, said:

"It is evident that the aggressive attitude taken by the free traders against the existing and tried economic conditions of the country has forced the issue of free trade or tariff to the front as the paramount question to be determined by the people in the coming Presidential campaign. There are many features of this question which seem to create very positive antagonisms in theory, but which, looked at in the light of practical experience, are not only simple enough, but should convince any reflecting person of the fallacy of the idea dominant among certain theorists that free trade is the panacea for all industrial aillings and opens the highway to exceptional industrial activity and national prosperity. When you think about it, just the reverse is the tendency. Look at the facts. Within a comparatively short time we can remember when steel rails were \$75 and even \$125 a ton. Every pound of that article used on our railroads was imported from England. Our gold went out of the country to pay for it. A few enterprising citizens who had the interests of their country and its labor, and not of the foreign manufacturers, at heart, began a movement looking to the manufacture of steel rails in the United States. All they needed was some guarantee of a price which would enable them to make the large investment required for the establishment of a plant and to pay our American workmen proper wages, not pauper wages, for their labor. A duty of \$28 a ton was placed on steel rails. The erection of Bessemer steel plants was commenced, and soon American capital and labor were turning out as fine steel rails as the English. What was the result? Our railroads, relieved from the extortionate demands of a foreign monopoly, could now buy rails at home for less than \$60 a ton, with a still downward tendency. A short time ago Congress took \$11 off the duty on steel rails, leaving \$17. In the meantime, with improved machinery and a reduction in the price paid for labor, which must always attend a reduction of duties, the price of steel rails has gone down to about \$35 a ton. Instead of paying an outrageous price to foreign monopolists, and draining our country of its financial resources, we are employing our own capital and our own labor, and distributing the money for the benefit of our own people. It is estimated that not more than one-tenth the amount of steel rails now used are imported, and even then the foreign monopolists are forced down to reasonable prices, brought about through protection and the encouragement of home industry.

THE MORRISON BILL.

"Now it is proposed to destroy this satisfactory condition of things by a free-trade movement, beginning with a horizontal reduction of 20 per cent., which would put the duty on steel rails down to about \$13.60. The first effect of such a reduction would be a reduction of at least 20 per cent. in the price of labor at the steel works, and at least 20 per cent. in the price of raw materials and the labor which produces them, or the closing up of our home establishments. How long the country could live in peace under such circumstances is a very simple proposition, and one that anybody should be able to answer. With the country drained of its money, and no employment for its working classes, industrial prostration would be the first step, and anarchy would follow in natural sequence.

"The same thing might be said of textile fabrics. I remember when calico was 37½ cents a yard. This was again the period of foreign monopoly. Our Southern planters received 4 cents a pound for cotton, which was sent all the way to England to be manufactured and then shipped back again. After much trouble our enterprising citizens from New England succeeded in having a duty put upon cotton fabrics, and with what result? Cotton mills began to appear, the whir of the spindles and the rattle of machinery began to resound among the hills of New England. To-day calico is so cheap that the wives and daughters of our working people will not wear it for best, and our cotton planters are getting 10 and 12 cents a pound for their cotton. More than this, the cotton mill is no longer a stranger to the South. We hear of them springing up in that section every day. And why? Simply because of the guarantee afforded by our American industrial system. The free traders talk about monopolists in a manner which only demonstrates an intensity of dullness almost inexplicable, or the influence of some subtle spell. Steel rails at free-

trade prices range from \$75 to \$125 per ton, and at tariff prices \$35 a ton. Calicoes at 37½ cents a yard, free-trade prices, and 6½ cents, tariff prices, and cotton at 4 cents a pound, free-trade prices, and 12 cents, tariff prices, should convince every manufacturer and workman, planter and farmer, that there is neither logic nor reason in free trade. But if they choose to call it monopoly, it were better for our own people to enjoy the benefits of their own monopoly than to be dependent and subservient to the extortions of a foreign monopoly."

Having suggested that these facts should be placed before the people, so that they could properly understand them, General Grant continued:

GENERAL GRANT'S OPINION OF RANDALL.

"It is therefore very important that both parties should make sagacious nominations—that is, of men who would have the interests of their own country and its people, and not foreign manufacturers, at heart. For this reason I have always felt an interest in such men as Mr. Tilden or Mr. Randall. Now that it is pretty well understood that Mr. Tilden or Mr. Payne will not run, I am in hopes that the Democratic party will see the wisdom of nominating Mr. Randall. There is no question of Mr. Randall's ability. I have met him, and have long watched his course, and I know that he would represent the better judgment of his own party.

SOME DOUBTS SUGGESTED.

"It might be possible that the Republicans at Chicago will not make the wisest selection of a candidate. It must not be lost sight of that it will take a great many Democratic votes to carry the States of New York and New Jersey. Should the nomination at Chicago not be of a person who would have a reasonable chance of carrying these votes, it would then be all-important to have a safe Democratic candidate, for New York will be the battle-ground of the campaign.


"If the Democrats should nominate a free trader, then I think the Republicans would have a reasonable expectation of electing anybody. I was much struck about a year ago by a speech made by Mr. Bayard, at a dinner given at Delmonico's, in support of a projected exposition. There were assembled bankers, merchants, commercial men and manufacturers representing millions of capital and the employment of thousands of our people. He tried to set forth the advantages of free trade. It was a most inopportune occasion for such a speech. I was much interested in watching the effect of his remarks upon the gentlemen congregated there, and particularly the whisperings of disapprobation. I believe Senator Beck made the same sort of a speech. A Democratic candidate with such views, I think, would be beaten by anybody. I have no doubt that the Democrats will be governed much by the nominees of the Republicans in June, but I believe that Mr. Randall would run well in New York, New Jersey and Indiana against some persons now talked about by the Republicans."

RELATIONS BETWEEN THE AMERICAS.

April 10.—The Senate Committee on Foreign Relations to-day reported adversely and recommended the indefinite postponement of two bills introduced by Senator Cockrell to provide for the appointment of a commission to visit the principal countries of Central and South America, and one bill introduced by Mr. Sherman to authorize the President of the United States to extend invitations to the governments of the Republics of Mexico, Central America and South America, and of the Empire of Brazil, to send delegates to a convention to be held in Washington to consider questions relating to the establishment upon a firm and lasting basis of peaceful and reciprocal commercial relations between the countries named and the United States. In place of these bills they reported an amendment to the Consular and Diplomatic bill, which provides that \$100,000 be appropriated to enable the President to compensate a commission to be appointed to examine and report upon the relations of the United States with the several countries of Central and South America, and upon the best modes of securing intimate national and commercial relations between them and the United States. The Secretary of State, writing in support of the amendment, says: "The true plan, it seems to me, is to make a series of reciprocity treaties with the States of Central and South America, taking care that those manufactures—and, so far as practicable, those products—which would come into competition with our own manufactures and products should not be admitted to the free list. By these treaties we might secure for valuable consideration, so as not to violate the 'most favored nation' clause of other treaties, further substantial advantages—such, for example, as the free navigation of their coasts, rivers and lakes."

INSTRUCTIONS TO CUSTOMS COLLECTORS. April 12.—The Secretary of the Treasury has issued instructions to customs officers in regard to the entry and appraisal of imported merchandise, from which we make the following extract: "Section 7 of the act of March 3, 1883, having abrogated the duties on charges incident to shipment and transportation of the goods, &c., the sole element of dutiable value now is the actual market value or wholesale price of the merchandise in the principal markets of the country whence exported and at the date of exportation. Merchandise duly invoiced cannot be entered at less than its invoice value. Where invoices show items which the importer may claim belong to the category of non-dutiable charges, but which the appraiser, on other invoices of similar goods, may have reported as belonging to the dutiable value of the merchandise, you will require the entries to include such items, and deposit of duties will be exacted on such full invoice value, subject, of course, to revision by the appraiser of such value, who will be at liberty to exclude from his return of dutiable value any items belonging to the class specified which, in his opinion, may not be dutiable. The amount reported by the appraiser as the dutiable value of the merchandise, whether it does or does not include items claimed by the importer to be non-dutiable, will be regarded as the value of the merchandise, subject to change by an appeal, if desired by the importer, to reappraisers, who will include in their return such items as in their judgment pertain to market value under

THE AMERICAN FLUTING MACHINE.
WITH ROLLS
5, 6 or 7 IN.
LONG.
Fluting Style
CHOICE OF
CRIMPING STYLE
DIFFERENT GRADES.



AMERICAN MACH. CO.
PHILA. PA.

No. 1. CROWN HAND FLUTER.



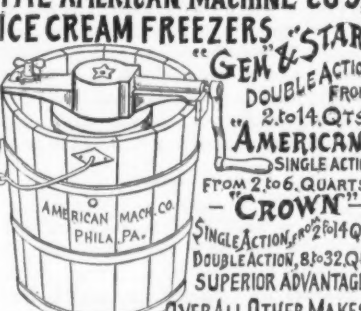
AMERICAN MACH. CO.
PHILA. PA.

THE A.M. CO. WRINGER.



No. 2 WITH ROLLS 10 IN. LONG 1 3/4 IN. DIA.
No. 2 1/2. " 12. " 1 3/4. "

THE AMERICAN MACHINE CO'S. ICE CREAM FREEZERS "STAR."
"GEN. & ACTION"
DOUBLE ACTION FROM
2 to 14 QTS.
"AMERICAN"
SINGLE ACTION
FROM 2 to 6 QUARTS.
"CROWN"
SINGLE ACTION, FROM 2 to 4 QTS.
DOUBLE ACTION, 8 to 32 QTS.
SUPERIOR ADVANTAGES
OVER ALL OTHER MAKES.

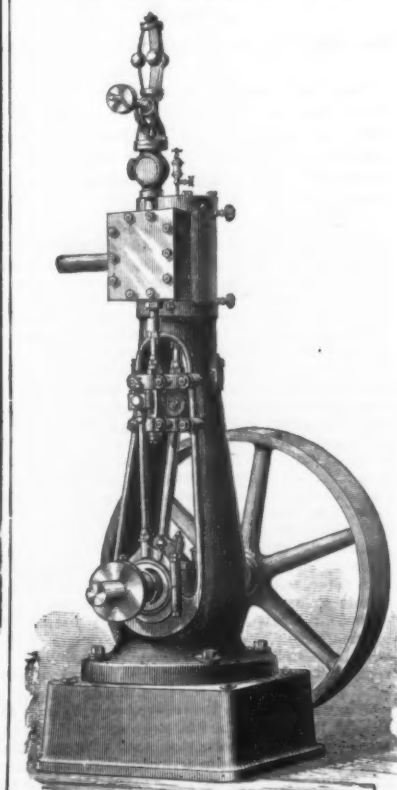


AMERICAN MACH. CO.
PHILA. PA.

N.Y.S.S.P. Co.

Vertical Steam Engines.

2 to 100 H. P.



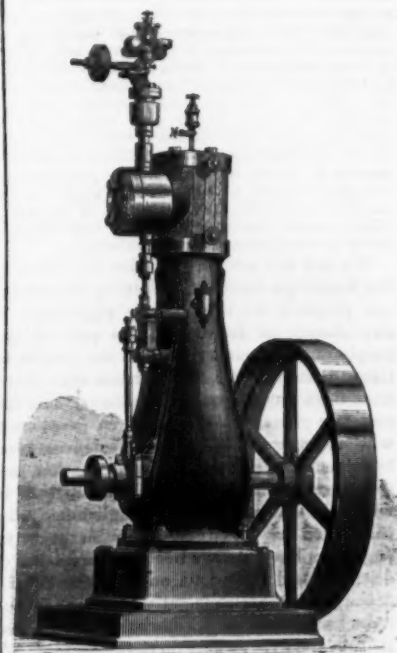
We have made a specialty of this class of Engines for 15 years, and in this period have built and sold

**2500 ENGINES,
50,000 Horse-Power.**

POPULAR, because RELIABLE.

CHEAP, because DURABLE.

DURABILITY best attested by the fact that many of them have been at work for TEN YEARS, giving utmost satisfaction to their owners, and having cost little or nothing for repairs.



Built throughout of the best materials, and on the principle of DUPLICATION OF PARTS. The following sizes always in stock and ready for instant delivery:

Horse-Power.	Size of Cylinder. Dia. Stroke.	Revolutions per Minute.	Diameter of Shaft.	Size of Wheel. Dia. Face.	Total Weight of Engine with Wheel.
2	3 x 5	250	1 12-16	20 x 3	342
3	3 1/2 x 5	250	1 12-16	20 x 4	367
4	4 x 6	200	1 15-16	24 x 4	522
5	5 x 6	200	1 15-16	24 x 5	557
6	5 1/2 x 7	180	2 7-16	32 x 4 1/2	889
8	6 1/2 x 7	180	2 12-16	32 x 6	977
10	7 x 9	160	2 15-16	42 x 7 1/2	1750
12	8 x 9	160	2 15-16	42 x 9	1865
15	9 x 12	150	3 15-16	48 x 9	3140
20	10 x 12	150	3 15-16	48 x 12	4080
30	12 x 12	150	5	60 x 12	5400

Prices Lately Reduced and Very Reasonable.

SEND FOR 18th ANNUAL CATALOGUE.

New York Safety Steam Power Co.,

E. T. COPELAND, General Agent,
No. 30 Cortlandt St., New York

Seasonable Specialties of THE AMERICAN MACHINE CO., PHILADELPHIA.

A. FIELD & SONS,
MANUFACTURERS OF

WIRE NAILS

Of Every Quality and Description.

Taunton, Mass., and 78 Chambers Street, New York.

SEYMOUR MANUFACTURING CO.,

Manufacturers of Superior Grass and Bush
SNATHS, GRAIN CRADLES
of all styles, both with Ring Fastening and with their
CREEDMOOR PATENT FASTENING.

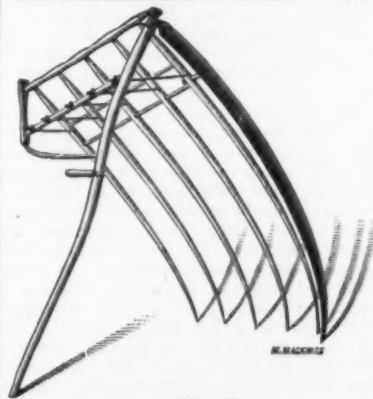


Fig. B.
Figure B shows the Creedmoor Fastening applied to Five-Fingered Dutch Bow Cradle.



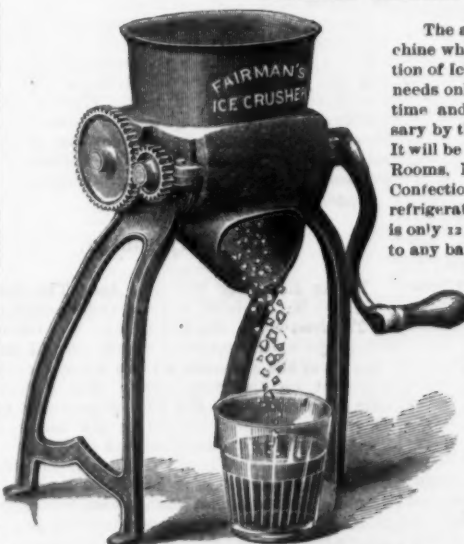
Fig. A.
Figure A shows the Creedmoor Fastening applied to all styles of Cradles.

The "Creedmoor" Patent Cradle Fastening is provided with an adjustable socket, by which the Cradle head may be easily attached or detached, and the Seythe can be more readily fitted or matched than the ordinary Cradle.

Also WAGON AND BUGGY SPOKES.
FACTORY, SEYMOUR, IND. Office, ST. LOUIS, MO.

FAIRMAN'S ICE-CRUSHING MACHINE.

PATENTED JANUARY 15th, 1884.



The above cut represents a new and valuable Machine which supplies a want long felt in the preparation of ice for its various uses, and we are confident needs only to be seen to be appreciated. It saves the time and avoids the disagreeable labor made necessary by the breaking of ice by hammers, ice picks, &c. It will be found to be indispensable by Hotels, Dining Rooms, Restaurants, Bars, Hospitals, Druggists and Confectioners, and for family use as necessary as a refrigerator. The Crusher occupies but a small space, is only 22 inches high, and can be attached by screws to any bar-top counter, table or shelf, as desired, and is operated so easily as to become a source of pleasure to use it.

In the preparation of iced drinks it has no equal. It also possesses the merit of great economy in the use of ice. We are at present making two sizes:

The No. 1.—Where only a small quantity is needed at a time.
The No. 2.—For Hotels, Restaurants and general family use.
THE TRADE SUPPLIED AT A LIBERAL DISCOUNT.*

We shall soon add to our list a larger size or No. 3 Machine.

Manufactured and Sold by
THE G. F. WARNER MANUFACTURING COMPANY.
NEW HAVEN, CONN.

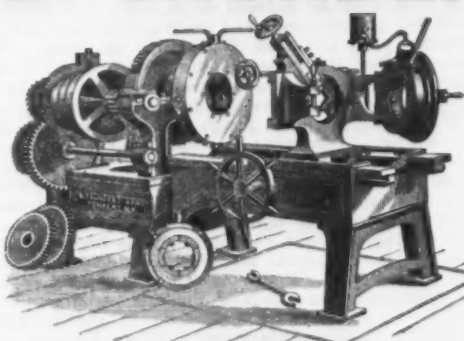
D. SAUNDERS' SONS

MANUFACTURERS OF

Pipe Cutting and
Threading Machines,
For Pipe Mill and Steam
Fitters' Use.

Tapping Machines,
For Steam Fitting. Also
STEAM AND GAS FITTERS.

HAND TOOLS,
No. 25 Atherton Street,
YONKERS, N. Y.



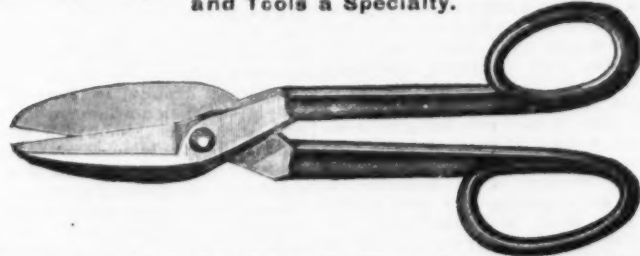
SEND FOR CIRCULARS.

LUMBER MEASURES OF ALL KINDS.

BURNT FIGURE BOARD AND LOG RULES,
LUMBER GAUGES AND LOG CALIPERS.

THE LUFKIN RULE CO., 137 Scott St., Cleveland, O.

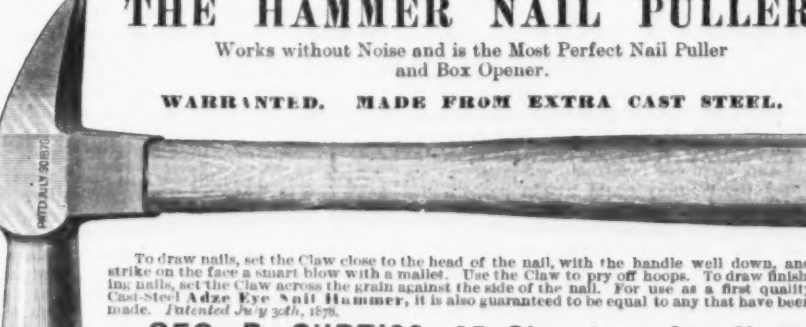
NIAGARA STAMPING & TOOL CO.,
147 and 149 E. 5th Street, Buffalo, N. Y.,
Manufacturers of Presses, Dies and Tools for Working Sheet Metal,
&c. Squaring and Circle Shears and Tinner's Machines
and Tools a Specialty.



TINNERS AND OTHERS—WE OFFER YOU THE BEST SNIPS EVER MADE. WE MAKE FOUR SIZES

No. 1..... 2..... 4..... 6..... 8.....
Cut..... 2 1/2..... 3..... 3 1/2..... 4.....
Weight..... 1 1/2..... 2..... 2 1/2..... 3..... 4.....
Price..... \$1.00..... \$1.50..... \$2.00..... \$2.50..... \$3.00.....
Postage..... 25 cents..... 50 cents..... 75 cents..... 1.00..... 1.25.....
We cannot send the Snips 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

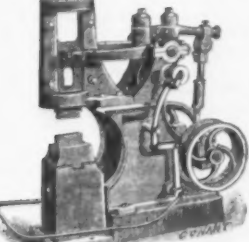
THE HAMMER NAIL PULLER
Works without Noise and is the Most Perfect Nail Puller
and Box Opener.
WARRANTED. MADE FROM EXTRA CAST STEEL.



To draw nails, set the Claw close to the head of the nail, with the handle well down, and strike on the face a smart blow with a mallet. Use the Claw to pry off hoops. To draw finishing nails, set the Claw across the grain against the side of the nail. For use as a first quality Cast-Steel Adze Eye Nail Hammer, it is also guaranteed to be equal to any that have been made. Patented July 30th, 1878.

GEO. B. CURTISS, 95 Chambers St., N. Y.

BEADRY'S UPRIGHT POWER HAMMER.
SIMPLE, PRACTICAL AND LOW-PRICED.
This Hammer is of an entirely new design and adapted to all kinds of work. It strikes a direct upright blow, and is given with the same elasticity as by a blacksmith's arm, and thus does not chill the work.



ALEXANDER BEADRY,
150 Portland Street, BOSTON, MASS.
For full Description and Testimonials, Send for Circular.

GLENN'S VALVE MANUFACTORY,
PATENT BALANCED
HYDRAULIC AND
STEAM VALVES.



J. S. GLENN, Proprietor,
OFFICE:
115 Fremont Street,
CHICAGO.

existing decisions. If the value thus fixed exceeded by 10 per cent. or more the value stated in the entry, 20 per cent. additional duty will be added under Section 2900, Revised Statutes. The importer has also his remedy against the inclusion of doubtful items of the character specified by protest, appeal and suit. These instructions will take effect on May 1, 1884.

THE SENATE PASSES THE NAVAL BILL.

April 14.—The Senate resumed the consideration of the Naval Appropriation bill to-day. An amendment was agreed to directing the Secretary of the Navy to report to Congress at its next session a plan for the construction of one armed vessel for the United States Navy, of not exceeding 8500 tons displacement, the cost of the same, with machinery and armament, and the time which the process of construction of such vessel would take. An amendment was also adopted requiring the Secretaries of War and the Navy, with the assistance of the Gun Foundry Board, to report on the first day of the next session of Congress a plan and estimate for the preparation and purchase of plant for a gun factory to complete guns from 6 inches caliber to 16 inches caliber, including buildings and shrinking-pit, and to report a full, detailed estimate for the cost of the work. The Senate appropriates \$500,000 to complete the ordnance outfit of the three steel cruisers and the new dispatch boat. It also adds to the Appropriation bill the substance of the bill recently passed by the Senate, but not yet acted on by the House of Representatives, authorizing the President to have constructed two cruisers, one dispatch vessel, four gunboats, one cruising torpedo boat and two harbor torpedo boats, and appropriates for this purpose \$2,500,000. For continuing work on the double-turreted monitors the Senate appropriates \$2,000,000.

AN ANTI-SILVER DOLLAR MEETING.

April 14.—A meeting of the representatives of various boards of trade was held at Willard's Hotel to-night, to urge upon Congress the policy of discontinuance, for two years at least, of the coinage of the silver dollar. Delegates were present from the commercial bodies of Portland, Providence, New Haven, New York, Philadelphia, Baltimore, Cincinnati, St. Louis and Minneapolis. Resolutions approving the policy of discontinuing silver coinage were read from the boards of trade of Mobile, New Orleans, Detroit, Louisville, Milwaukee, Buffalo, Memphis, Paterson, Cleveland and Charleston and the New York Stock, Cotton and Produce exchanges. These bodies represent the active business interests of the leading cities of the country, and in every case, with but one exception, the resolutions were reported as having been adopted unanimously.

AN IMPORTANT PATENT DECISION.

April 14.—The Supreme Court of the district, sitting in banc, to-day decided, in the patent case of Hoe against Scott, that there is no appeal to the Secretary of the Interior from a decision of the Commissioner of Patents. The custom of entertaining such appeals sprung up during Secretary Kirkwood's administration, and has continued down to the present time, the records showing that many decisions of the Commissioner have been reversed by the Secretary.

A PROPOSED COURT OF APPEALS.

April 14.—The Senate Committee on the Judiciary reported adversely to-day the bills introduced by various Senators for the relief of the Supreme Court, and submitted instead the Davis bill to provide for the establishment of a Court of Appeals, as it passed the Senate last year, with some unimportant amendments. This bill provides for the appointment of two additional judges in each United States Judicial Circuit, for the establishment in each of the Judicial Circuits of the United States of a Court of Appeals. Writ of error may be taken to the proposed Court of Appeals from any final judgment or decree of any Circuit or District Court within the circuit when the amount claimed or the value of the property in controversy exceeds \$500. The decisions of the proposed Court of Appeals shall in all cases be final upon questions of fact, except in certain cases noted, but a review upon the law may be had upon writ of error or appeal, in the manner now provided by law, to the Supreme Court of the United States in cases where the matter in controversy exceeds in value \$10,000, exclusive of costs, or where the adjudication involves a legal question of sufficient importance to require that the final decision thereof should be made by the Supreme Court, or a question upon the construction of the Constitution, or of the law of the United States. In patent or copyright cases in equity a review by the Supreme Court may be had without regard to the sum and value in dispute.

MR. HEWITT PREPARES A TARIFF BILL.

April 14.—As chairman of a sub-committee, Mr. Hewitt has been for some time engaged in the preparation of a bill designed to remove, so far as practicable, the difficulties in the way of efficient and uniform administration of the tariff law. Many of these difficulties were suggested by the letter sent to the Ways and Means Committee on February 7, by the Secretary of the Treasury. Mr. Hewitt has completed a draft of the proposed bill, and it was sent to the printer to-day. "It does not change a single rate of duty, and is designed simply to promote a better administration of the customs service," said Mr. Hewitt. For a bill such as Mr. Hewitt has prepared there may be little difficulty in securing consideration, for it aims at a kind of "tariff reform" which is generally regarded as necessary.

THE MORRISON TARIFF BILL TO BE CONSIDERED.

April 15.—The House to-day voted to take up the Morrison tariff bill by a majority of two votes. Colonel Morrison made the motion that the House resolve itself into Committee of the Whole to consider revenue bills. S. S. Cox took the chair, the title of the bill was read, and then there was an instant of suspense until Mr. Eaton rose and objected to consideration. "I also object," added Judge Kelley. The objection was reported to the House, and then Judge Kelley demanded the yeas and nays. The result announced was 140 to 133. Ninety-nine

Republicans and 39 Democrats voted in the negative. The Democrats were: Hewitt, of Alabama; Budd, Glasscock, Henley and Tully, California; Eaton, Connecticut; Lamb, Indiana; Finerty, Illinois; Hunt, Louisiana; Findlay, Maryland; Ferrell, Fiedler and McAdoo, New Jersey; Converse, Foran, Paige, Warner and Wilkins, Ohio; Boyle, Curtin, Duncan, Elliott, Ermentrout, Hopkins, Post, Randall, Storm, Mutchler and Patton, Pennsylvania; Barbour and Wise, Virginia; and Arnold, Hardy, Muller, Robinson, Van Alstyne, Wemple, Spriggs and Stevens, of New York.

The tariff debate of 1884 was then opened by Chairman Morrison, who read until he was weary from a speech in manuscript, and obtained permission to print the remainder. Judge Kelley spoke next. A large portion of the speech was devoted to a relation of his observations during his last year of the condition of the workingmen, women and children of "Merry Free Trade England." Mr. Mills, of Texas, declared that the Morrison bill would reduce the cost of imported goods, enhance the price of American exports, advance the wages of American workingmen and confer numerous other blessings upon the people of the United States. Nearly 70 men have already informed the chairman of the Committee of the Whole that they desire to make speeches, and within a day or two the number will probably increase to at least 100. There is talk of holding evening sessions for debate only on the bill. Even if that be done the general debate will continue at least a fortnight if only one half of the men make speeches who desire to do so. It is expected that as soon as general debate is closed a motion will be made to strike out the enacting clause of the bill. If it should be carried, tariff agitation in Congress would cease for 18 months at least. Whether the tariff debate will be allowed to continue without interruption is uncertain. Other important measures are pressing for consideration, and probably not many days will pass before efforts will be made to push the Morrison bill aside. In view of the strenuous exertions required to keep it alive to-day, it is by no means improbable that the bill will be summarily killed by the Committee of the Whole.

INDUSTRIES AND FARM WAGES.

The Department of Agriculture, in a recent investigation of the effect of other industries upon the wages of labor, has brought out some interesting data showing the advantage of manufactures in that direction.

At the commencement of the era of manufactures in the United States, about 50 years ago, the average wages of farm labor was \$0 per month, with board. In 1879, when the national currency was at par and industrial depression was at its lowest depth, the rate was \$10.54. The average in 1882, with a hearty development of industry, was \$12.41. This is taken as the average of the present era, or an increase of 37 per cent. over the wages of 30 years ago. The report goes on to show the influence of large industrial population on the rate of agricultural wages, and sets forth its effects in different sections of the same State. In Ohio, for instance, in the northern part of the State, with Cleveland, Toledo and other manufacturing cities, labor averaged in 1882 \$25.96 per month. In the western district, which is agricultural, with Cincinnati, Dayton, Springfield and other manufacturing towns, the average is \$24.75. In the eastern district, with a large agricultural element, the average is but \$22.65. In Kentucky, with four-tenths of its people engaged in agriculture, the average is \$18.20. In the Middle States the presence of large manufacturing communities has operated with similar results. The effect is peculiarly noticeable in New Jersey, lying between the two great manufacturing cities of New York and Philadelphia. The relative rates of wages of farm hands in 1882 in those States were:

New York.....	\$23.62
New Jersey.....	\$24.25
Pennsylvania.....	\$22.88

Prison Labor.

Mr. Baker, Superintendent of State Prisons, in a report sent to the New York State Senate, in answer to a resolution of the Senate calling for information as to what substitute can be adopted for the present contract system, said that in less than a year over one-sixth of the prisoners in the State prisons will be released from the service and labor on which they are now lawfully and beneficially engaged. This fraction will be constantly augmented until it will embrace the majority of the prisoners in the near future. To show the exact condition of the prisons, he presented the following statistics:

Contract.	Contractors.	No. of Contracts.	Price.	Expires.
Axle.....	Sheldon & Co.....	225	\$0.50	Feb. 28, '84
Collar.....	Auburn Collar Co.....	60	.60	Ap'l 30, '84
Hame.....	Hayden & Boyd.....	100	.50	Sept 30, '85
H'w-ware.....	Jones & Merritt.....	150	.50	Dec. 13
Shoe.....	Dunn, Barber Co.....	100	.60	Jan. 4, '87
CLINTON PRISON.				
Clothing.....	New York State Clothing Co.....	450	.35	Jun. 10, '88
SING SING PRISON.				
Stoves.....	Perry & Co.....	900	.56	Feb. 28, '87
Shoes.....	Bay State Shoe & S.....	300	.63	Aug. 31, '87
Laundry.....	Leather Co.....	20	.30	Nov. 30, '86
	Mahoney & Stone.....	130	.60	Nov. 30, '86

There are, Mr. Baker declares, only three practical methods of employing prison labor besides the contract system:

1. To work the convicts on State account. This system has been tried with disastrous results, morally and financially. The State, under this plan, becomes a manufacturer or a producer. At present the State sells only the labor of convicts; under the State account system the State also puts in its capital, so far as it may be required to work the prisoners. Complaint is now made of the competition of prison labor with free labor. It is not easy to conceive how the force of such competition will be lessened when a commonwealth like New York adds to the

labor of its prison convicts the capital which it can command. The State never was able to manufacture with economy, and there is no reason to expect that it ever will.

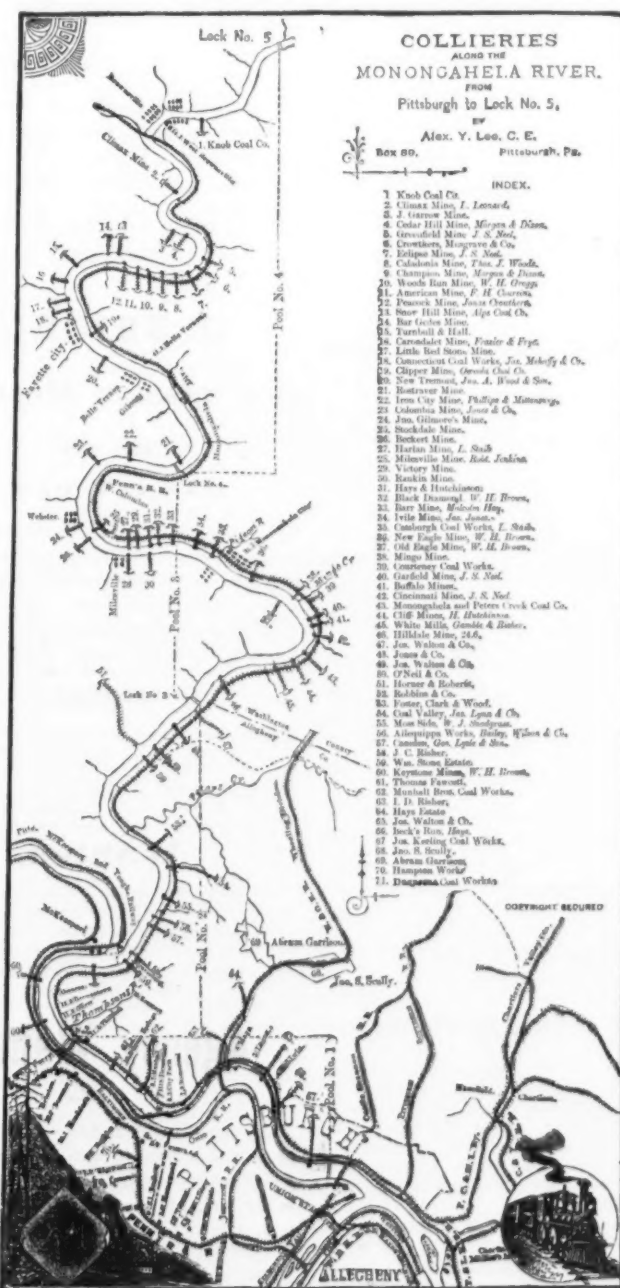
2. The piece-price system. This is no more than a modified contract system. The contractor delivers to the prison managers the raw materials, and the State, by its convicts, works them into the manufactured articles and delivers them to the contractor. The manufactured article will be subject to inspection by the contractor, and the imperfect portions will be rejected and thrown back on the State.

The public-account system—that is, on State work or on State service. This is a feature of the Irish and English prison systems. The convicts in those prisons make clothing, erect buildings for the Government works, work farms for the support of the prisons, build docks, breakwaters, make bricks, dress stone and do carpentry work.

These kinds of employment are mentioned simply as illustrations of the possibilities of working convicts on the public account. It is proposed by some to refer the question of molding the future system to a commission of citizens. If no such action be taken, the pre-emption must be that the superintendent will be compelled to adopt the State-account system in part next December, when the first contract expires.

The Monongahela Coal District.

Through the kindness of Mr. A. Y. Lee, C. E., of Pittsburgh, Pa., we are enabled to present herewith a map of the Monongahela



THE MONONGAHELA COAL DISTRICT.

River from Pittsburgh to Lock No. 5, with the locations of all of the coal mines that are opened indicated, and an index attached giving owners or operators. Most of the coal that reaches Pittsburgh by river and is sent to the town markets of the Ohio and Mississippi, and which in common parlance is known as "Pittsburgh coal," comes from the first four pools of the Monongahela River represented on this map. The coal of these various pools, however, differs greatly in quality, that of the first and second pools being an admirable gas coal, as well as steam coal, and is in great demand in the lower markets. That in the third pool is somewhat inferior to the first and second, while the fourth pool coal, which is a harder coal, and is for some purposes more desirable even than that of the first and second pools, is inferior as a gas coal, and, consequently, does not command as good a price in the lower markets.

It may be well to say that this map is a section from a general indexed map showing the coal and coke interests of Western Pennsylvania, their relation to railroads, &c., which is now being published by Mr. Lee.

It is interesting to note the opinions of intelligent foreigners on current American topics. At a recent meeting of the stockholders of William Jessop & Sons, Limited, at Sheffield, England, the proceedings of which have just reached us, Mr. Thomas Jessop, the chairman, said he was afraid that they must not expect for some short time to come to have that trade with America that they had in 1882, but still he was glad to say that they were holding their own. The present action in Congress with regard

to the tariff was one that would somewhat unsettle business until disposed of one way or another. They were aware that a bill was before the House to make considerable reductions in the duties on imports, and steel came under the same list as iron and other things of that nature. He did not anticipate that it would be carried, and, therefore, he thought that when the matter had settled down they would get back into fair and reasonable trade.

Marine Notes.

The United States dispatch boat Dolphin, built at Roach's yard, at Chester, Pa., was successfully launched on the 12th inst. The extreme length of the Dolphin is 256 feet; length between perpendiculars, 240 feet; beam, 32 feet; hold, 42 feet; displacement, 1845 tons. The engines will have 2300 horse-power, and there will be accommodations for 80 men. There was a large number of persons present to see the launch, among them Secretary Chandler, Admiral Mullaney and other officers of the navy.

The large iron and steel steamship H. F. Dimock, was successfully launched on the 12th inst. at the shipyard of William Cramp & Sons, Kensington, Philadelphia. The vessel is being constructed for the Metropolitan Steamship Company, of New York, for service on the line between New York and Boston. The president and several of the managers of the Metropolitan Steamship Company were on board the vessel when she was launched.

The steam yacht Lagonda, owned by Mr. J. C. Hoagland, was launched from Mumm's

She has two iron decks and four water-tight bulkheads, is brig rigged, and cost \$125,000.

A submarine boat was tried recently on the Malar Lake, Sweden, and will shortly be brought over to France. The boat has the shape of a cigar, is 64 feet long, 6 feet wide, and has an engine of 30 horse-power. It is said that it can be navigated under water, goes at the speed of 10 nautical miles the hour, and that four persons can, without any danger, remain in it for six hours running. The funnel-shaped cylinder is the only part of the boat which is visible. A winding stair leads to the boat, which is steered from the top of the cylinder, where a glass roof enables the man at the wheel to see the surface of the water and direct the course of his strange submarine engine.

The new steamer Nordland, of the Red Star Line, arrived at New York on the 11th inst., from Antwerp. Her dimensions are: Length, 400 feet; breadth of beam, 47 feet, and depth of hold, 35 feet. Her gross measurement is 4700 tons. The hull is constructed entirely of steel, and is divided into a number of water-tight compartments. There are four complete decks, three of which are steel-plated. The engines of the Nordland are of 2500 indicated horse-power, and are of the newest pattern. The high and low pressure cylinders are 48 and 85 inches in diameter, respectively, and the piston stroke is 60 inches. There are three double-ended oval-shaped steel boilers, which are heated by 18 furnaces.

Pullman Iron and Steel Company.

The Pullman Iron and Steel Company, of Pullman, Ill., was organized some months ago for the manufacture of the Perkins bayonet-pointed spike. The works are of iron and cover an area of over 27,000 square feet. The main building, of which the frame is part of one of the Centennial buildings, has a clear span of roof of 120 x 192 feet. The works contain two roll trains, one 18 inches, three-high, one 10 inches, three-high, built by Robinson, Rea & Co., Pittsburgh, the rolls of which were turned by A. D. Thomas, of the same place. The engines for these roll trains are a 500 horse-power 30 x 48 inch cylinder, having a 30-ton fly-wheel, to drive the 18-inch roll train, and a 200 horse-power 20 x 24 inch cylinder, 5-ton fly-wheel, to drive the 10-inch roll train, built by Messrs. Witherow & Gordon, of Pittsburgh. The Morgan Engineering Company, of Alliance, Ohio, had the contract for the 6000-pound steam hammer, the anvil block of which is one casting and weighs 30,000 pounds, and also for a large lever scrap shears of a total weight of 66,000 pounds, which is driven by its own engine. A smaller lever bar shears capable of cutting a bar 6 x 1 inch, having its own engine, and the roll-turning lathe, is furnished by the same company. James McNeil & Co., Pittsburgh, furnished three steel boilers, each 54 inches diameter and 28 feet long, with five flues in each. They are set up in one battery and furnish steam for all the engines of the works. The machine tools for machine shop and pump were furnished by the Niles Tool Works, 153 Lake street, Chicago. The spike machines were built partly by the Union Foundry and Car Wheel Company, of Pullman, and partly in the company's own machine shop, and have been especially designed for the manufacture of the Perkins spike. The heating furnaces are those known as the Swindell improved Siemens gas furnace, built by Swindell Bros., of Pittsburgh.

The capacity of these works, which have but recently been put in operation, is 500 kegs of spikes a day, and 30 tons bar and rod iron, which will chiefly be used by the Pullman's Palace Car Works.

The Semi-Centennial of the Pennsylvania Railroad.—On Wednesday of this week occurred the 50th anniversary of the opening of the railroad from Philadelphia to Columbia, Pa.—the great Pennsylvania Railroad in embryo. The original object of the road to Columbia was to connect with the canal system of the State. From this crude beginning has sprung the present great system of steel highways known as the Pennsylvania system, the main tracks of which, if extended, would reach from Philadelphia across the Atlantic Ocean, through Europe to China, or westward around the globe to Japan, whose second tracks and sidings would extend across the American Continent and 1000 miles into the Pacific Ocean. The cars and engines of the system would reach from Lake Erie to Atlantic City, N. J., and its employees side by side would form a line from Philadelphia to Trenton. The steel and iron used in the rails and rolling stock would make a shaft 8 inches in circumference over 25,000 miles long, and the timber used in the construction of its tracks and sidings would consume a double row of trees 10 feet apart from the source of the Missouri River, down the Mississippi to the Gulf of Mexico. Nearly \$1000 an hour pours into the treasury of this mighty corporation, and its net earnings are sufficient to pay 2 1/2 per cent. interest on the national debt.

The Smith-Casson Heating and Puddling Furnaces.—In our issue of last week we omitted to mention that Philip S. Justice & Co., 14 North Fifth street, Philadelphia, represent Mr. Smith-Casson in this country, and are prepared to furnish information, drawings, &c., to those interested.

Work on the cable road has been begun at 140th street and Tenth avenue, New York. The foundations of the engine-house, from which the entire road is to be operated, are being laid at 128th street and Tenth avenue. The building, which will be built of brick, will be 200 feet square. The road is to be equipped with duplicate cables, so that in case of accident to one the second may be gripped by the clutch and prevent any delay. Mr. D. J. Miller, the civil engineer who was employed in the construction of the cable roads in Chicago, has charge of the work.

A report from Syracuse, N. Y., dated the 12th inst., states that Thomas Gale, an old salt manufacturer, has struck a bed of rock salt at a depth 1400 feet. Brins of 100", the highest test, is also reported as being found in large quantities.

Special Notices.

E. BISSELL & CO.,

AUCTIONEERS.

TUESDAY, APRIL 23, AT 10 O'CLOCK,
At 83 Chambers and 65 Reade Streets, New York.

TRADE SALE OF

Hardware, Edge Tools, House Furnishing Goods,
Shovels and Spades, &c., &c.

WEDNESDAY, APRIL 24, AT 10 O'CLOCK.

SPECIAL SALE OF

About 12,000 dozen Table Knives and Forks, first
and second quality; Carvers', Butcher Knives,
Plated Goods, &c., &c.

Also a large assortment of Pocket Cutlery in 1,
2, 3 and 4 blades.

Parties who desire to contribute to this sale will
please forward their invoices at as early a date
as possible.

AGENCY WANTED.

An energetic Salesman, well acquainted with the
Mining and other trade of the Anthracite Coal
Regions, desires handling a line of Mine Supplies,
Hardware, &c., on salary or commission.
References given.
Address "SUPPLIES, 102,"
Office of The Iron Age, 83 Reade St., New York.

RECEIVER'S SALE of the DELAWARE
ROLLING MILL,

AT PHILLIPSBURG, NEW JERSEY.

By order of the Chancellor of the State of New
Jersey the Delaware Rolling Mill, fixed Machinery,
Engines, Boilers, all Tools and everything apper-
taining to the Mill, with four lots of ground. This
mill is well furnished with the requisite appliances
for producing sixty or seventy tons of finished iron
per day, has siding from Pennsylvania Railroad.
Carp for coal, stables, sheds, and storage
rooms, scales and dwelling house. Sold free and
clear of all incumbrance whatever, on Wednesday,
May 14, 1884, at 2 o'clock P. M., on the premises at
Phillipsburg. For further information apply to
PETER L. VOORHEES.

120 Market St., Camden, N. J.
SAM'L B. HUEY, 36 S. 3d St., Phila., Pa.
ROBT H. HINCKLEY, 204 S. 5th St., Phila., Pa.

SPECIAL NOTICE.

Manufacturers

WANTING NEW YORK SALESROOM AND
STORAGE ROOM CAN BE ACCOMMODATED
WITH ALL NECESSARY SERVICES, SUCH AS
RECEIVING AND DELIVERING GOODS, IN-
VOICING, &c., AT A REASONABLE COM-
PENSATION, BY

"GOOD LOCATION,"

Office of The Iron Age, 83 Reade Street, New York.

WANTED.

A situation as practical Sheet Steel Roller.
Good reference.
Apply to WILLIAM WILSON,
P. O. Box 6, Middletown, N. Y.

\$2000

in Real Estate to exchange for an interest in
Hardware, Iron or Tin Manufacturing business,
by energetic, reliable young man.

Address "P. O. BOX No. 482,"
Philadelphia.

WANTED.

Entry Clerk, single, good penman, must be
thoroughly posted in the Hardware business. Ad-
dress, stating age, experience, reference, and salary
expected, "INDUSTRY, BOX 48,"
Office of The Iron Age, 83 Reade St., New York.

WANTED.

A traveling Salesman to sell a first class English
Tool Steel on commission. Apply to "K. M. B.,"
Office of The Iron Age, 83 Reade St., New York.

STEEL GOODS.

We will mail, on application, price lists and dis-
counts on Buffalo Farming Tool Co.'s Hoes, Forks,
Rakes, &c.

HENRY BROOKS & CO.,
Sole Agents,
Boston, Mass.

Heavy Bronze and Brass Castings.

A firm having ample floor room and both
Crucible and Air Furnaces desires to enter into
correspondence with parties requiring regular
supplies of heavy green sand, dry sand or beam
castings in Brass, Composition or Pure Bronze.
First-class work at reasonable prices. Can allow
good figures for large castings in part payment.
"A. H.," Lock 35, West Troy, N. Y.

WANTED.

Two experienced Salesmen to sell Hardware
Specialties in the Eastern States on commission.
Address "ATTWELL,"
Office of The Iron Age, 83 Reade St., New York.

Commercial Travelers, Attention.

Travelers for wholesale houses wishing to in-
crease their incomes without additional expense
or trouble should address as below. Good com-
missions paid. A few orders per day will give fair
profits. State line of goods, territory covered,
and usual number of houses visited each trip.
"LOCK BOX 46,"
Troy, N. Y.

A GENTLEMAN about 45 years of age, a civil en-
gineer by profession, and for many years identified
in the construction and management of railroads at
the West and southwest, seeks a situation either in
railroad work or in business where his knowledge
and experience will render his services of value.
Address "ENGINEER BOX 75,"
Office of The Iron Age, 83 Reade St., New York.

POSITION Wanted—By a Gentleman with 15
years' experience in Builders' Hardware,
Agricultural Implements, &c. Good salesman;
good references.
Address "IMPLEMENTS,"
Office of The Iron Age, 83 Reade St., New York.

Special Notices.

New & Second-Hand Machinery.

NEW.

1 Engine Lathe, 10 in. x 3 1/2 ft.
1 each, Engine Lathes, 11 in. x 4 and 5 ft.
1 each, " " 13 in. x 5, 6 and 8 ft.
1 Engine Lathe, 14 in. x 5, 6 and 8 ft.
1 " " 16 in. x 6 ft.
1 each, Engine Lathes, 16 in. x 6, 7, 8 and 10 ft.
1 Engine Lathe, 18 in. x 6, 8, 10 and 12 ft.
1 " " 20 in. x 8, 10, 12, 14 and 16 ft.
1 " " 22 in. x 8, 10, 12, 14 and 16 ft.
1 " " 24 in. x 10, 12, 14 and 16 ft.
1 " " 26 in. x 10, 12, 14 and 16 ft.
1 " " 28 in. x 10, 12, 14 and 16 ft.
1 " " 30 in. x 10, 12, 14 and 16 ft.
1 " " 32 in. x 10, 12, 14 and 16 ft.
1 " " 34 in. x 10, 12, 14 and 16 ft.
1 " " 36 in. x 10, 12, 14 and 16 ft.
1 " " 38 in. x 10, 12, 14 and 16 ft.
1 " " 40 in. x 10, 12, 14 and 16 ft.
1 " " 42 in. x 10, 12, 14 and 16 ft.
1 " " 44 in. x 10, 12, 14 and 16 ft.
1 " " 46 in. x 10, 12, 14 and 16 ft.
1 " " 48 in. x 10, 12, 14 and 16 ft.
1 " " 50 in. x 10, 12, 14 and 16 ft.
1 " " 52 in. x 10, 12, 14 and 16 ft.
1 " " 54 in. x 10, 12, 14 and 16 ft.
1 " " 56 in. x 10, 12, 14 and 16 ft.
1 " " 58 in. x 10, 12, 14 and 16 ft.
1 " " 60 in. x 10, 12, 14 and 16 ft.
1 " " 62 in. x 10, 12, 14 and 16 ft.
1 " " 64 in. x 10, 12, 14 and 16 ft.
1 " " 66 in. x 10, 12, 14 and 16 ft.
1 " " 68 in. x 10, 12, 14 and 16 ft.
1 " " 70 in. x 10, 12, 14 and 16 ft.
1 " " 72 in. x 10, 12, 14 and 16 ft.
1 " " 74 in. x 10, 12, 14 and 16 ft.
1 " " 76 in. x 10, 12, 14 and 16 ft.
1 " " 78 in. x 10, 12, 14 and 16 ft.
1 " " 80 in. x 10, 12, 14 and 16 ft.
1 " " 82 in. x 10, 12, 14 and 16 ft.
1 " " 84 in. x 10, 12, 14 and 16 ft.
1 " " 86 in. x 10, 12, 14 and 16 ft.
1 " " 88 in. x 10, 12, 14 and 16 ft.
1 " " 90 in. x 10, 12, 14 and 16 ft.
1 " " 92 in. x 10, 12, 14 and 16 ft.
1 " " 94 in. x 10, 12, 14 and 16 ft.
1 " " 96 in. x 10, 12, 14 and 16 ft.
1 " " 98 in. x 10, 12, 14 and 16 ft.
1 " " 100 in. x 10, 12, 14 and 16 ft.
1 " " 102 in. x 10, 12, 14 and 16 ft.
1 " " 104 in. x 10, 12, 14 and 16 ft.
1 " " 106 in. x 10, 12, 14 and 16 ft.
1 " " 108 in. x 10, 12, 14 and 16 ft.
1 " " 110 in. x 10, 12, 14 and 16 ft.
1 " " 112 in. x 10, 12, 14 and 16 ft.
1 " " 114 in. x 10, 12, 14 and 16 ft.
1 " " 116 in. x 10, 12, 14 and 16 ft.
1 " " 118 in. x 10, 12, 14 and 16 ft.
1 " " 120 in. x 10, 12, 14 and 16 ft.
1 " " 122 in. x 10, 12, 14 and 16 ft.
1 " " 124 in. x 10, 12, 14 and 16 ft.
1 " " 126 in. x 10, 12, 14 and 16 ft.
1 " " 128 in. x 10, 12, 14 and 16 ft.
1 " " 130 in. x 10, 12, 14 and 16 ft.
1 " " 132 in. x 10, 12, 14 and 16 ft.
1 " " 134 in. x 10, 12, 14 and 16 ft.
1 " " 136 in. x 10, 12, 14 and 16 ft.
1 " " 138 in. x 10, 12, 14 and 16 ft.
1 " " 140 in. x 10, 12, 14 and 16 ft.
1 " " 142 in. x 10, 12, 14 and 16 ft.
1 " " 144 in. x 10, 12, 14 and 16 ft.
1 " " 146 in. x 10, 12, 14 and 16 ft.
1 " " 148 in. x 10, 12, 14 and 16 ft.
1 " " 150 in. x 10, 12, 14 and 16 ft.
1 " " 152 in. x 10, 12, 14 and 16 ft.
1 " " 154 in. x 10, 12, 14 and 16 ft.
1 " " 156 in. x 10, 12, 14 and 16 ft.
1 " " 158 in. x 10, 12, 14 and 16 ft.
1 " " 160 in. x 10, 12, 14 and 16 ft.
1 " " 162 in. x 10, 12, 14 and 16 ft.
1 " " 164 in. x 10, 12, 14 and 16 ft.
1 " " 166 in. x 10, 12, 14 and 16 ft.
1 " " 168 in. x 10, 12, 14 and 16 ft.
1 " " 170 in. x 10, 12, 14 and 16 ft.
1 " " 172 in. x 10, 12, 14 and 16 ft.
1 " " 174 in. x 10, 12, 14 and 16 ft.
1 " " 176 in. x 10, 12, 14 and 16 ft.
1 " " 178 in. x 10, 12, 14 and 16 ft.
1 " " 180 in. x 10, 12, 14 and 16 ft.
1 " " 182 in. x 10, 12, 14 and 16 ft.
1 " " 184 in. x 10, 12, 14 and 16 ft.
1 " " 186 in. x 10, 12, 14 and 16 ft.
1 " " 188 in. x 10, 12, 14 and 16 ft.
1 " " 190 in. x 10, 12, 14 and 16 ft.
1 " " 192 in. x 10, 12, 14 and 16 ft.
1 " " 194 in. x 10, 12, 14 and 16 ft.
1 " " 196 in. x 10, 12, 14 and 16 ft.
1 " " 198 in. x 10, 12, 14 and 16 ft.
1 " " 200 in. x 10, 12, 14 and 16 ft.
1 " " 202 in. x 10, 12, 14 and 16 ft.
1 " " 204 in. x 10, 12, 14 and 16 ft.
1 " " 206 in. x 10, 12, 14 and 16 ft.
1 " " 208 in. x 10, 12, 14 and 16 ft.
1 " " 210 in. x 10, 12, 14 and 16 ft.
1 " " 212 in. x 10, 12, 14 and 16 ft.
1 " " 214 in. x 10, 12, 14 and 16 ft.
1 " " 216 in. x 10, 12, 14 and 16 ft.
1 " " 218 in. x 10, 12, 14 and 16 ft.
1 " " 220 in. x 10, 12, 14 and 16 ft.
1 " " 222 in. x 10, 12, 14 and 16 ft.
1 " " 224 in. x 10, 12, 14 and 16 ft.
1 " " 226 in. x 10, 12, 14 and 16 ft.
1 " " 228 in. x 10, 12, 14 and 16 ft.
1 " " 230 in. x 10, 12, 14 and 16 ft.
1 " " 232 in. x 10, 12, 14 and 16 ft.
1 " " 234 in. x 10, 12, 14 and 16 ft.
1 " " 236 in. x 10, 12, 14 and 16 ft.
1 " " 238 in. x 10, 12, 14 and 16 ft.
1 " " 240 in. x 10, 12, 14 and 16 ft.
1 " " 242 in. x 10, 12, 14 and 16 ft.
1 " " 244 in. x 10, 12, 14 and 16 ft.
1 " " 246 in. x 10, 12, 14 and 16 ft.
1 " " 248 in. x 10, 12, 14 and 16 ft.
1 " " 250 in. x 10, 12, 14 and 16 ft.
1 " " 252 in. x 10, 12, 14 and 16 ft.
1 " " 254 in. x 10, 12, 14 and 16 ft.
1 " " 256 in. x 10, 12, 14 and 16 ft.
1 " " 258 in. x 10, 12, 14 and 16 ft.
1 " " 260 in. x 10, 12, 14 and 16 ft.
1 " " 262 in. x 10, 12, 14 and 16 ft.
1 " " 264 in. x 10, 12, 14 and 16 ft.
1 " " 266 in. x 10, 12, 14 and 16 ft.
1 " " 268 in. x 10, 12, 14 and 16 ft.
1 " " 270 in. x 10, 12, 14 and 16 ft.
1 " " 272 in. x 10, 12, 14 and 16 ft.
1 " " 274 in. x 10, 12, 14 and 16 ft.
1 " " 276 in. x 10, 12, 14 and 16 ft.
1 " " 278 in. x 10, 12, 14 and 16 ft.
1 " " 280 in. x 10, 12, 14 and 16 ft.
1 " " 282 in. x 10, 12, 14 and 16 ft.
1 " " 284 in. x 10, 12, 14 and 16 ft.
1 " " 286 in. x 10, 12, 14 and 16 ft.
1 " " 288 in. x 10, 12, 14 and 16 ft.
1 " " 290 in. x 10, 12, 14 and 16 ft.
1 " " 292 in. x 10, 12, 14 and 16 ft.
1 " " 294 in. x 10, 12, 14 and 16 ft.
1 " " 296 in. x 10, 12, 14 and 16 ft.
1 " " 298 in. x 10, 12, 14 and 16 ft.
1 " " 300 in. x 10, 12, 14 and 16 ft.
1 " " 302 in. x 10, 12, 14 and 16 ft.
1 " " 304 in. x 10, 12, 14 and 16 ft.
1 " " 306 in. x 10, 12, 14 and 16 ft.
1 " " 308 in. x 10, 12, 14 and 16 ft.
1 " " 310 in. x 10, 12, 14 and 16 ft.
1 " " 312 in. x 10, 12, 14 and 16 ft.
1 " " 314 in. x 10, 12, 14 and 16 ft.
1 " " 316 in. x 10, 12, 14 and 16 ft.
1 " " 318 in. x 10, 12, 14 and 16 ft.
1 " " 320 in. x 10, 12, 14 and 16 ft.
1 " " 322 in. x 10, 12, 14 and 16 ft.
1 " " 324 in. x 10, 12, 14 and 16 ft.
1 " " 326 in. x 10, 12, 14 and 16 ft.
1 " " 328 in. x 10, 12, 14 and 16 ft.
1 " " 330 in. x 10, 12, 14 and 16 ft.
1 " " 332 in. x 10, 12, 14 and 16 ft.
1 " " 334 in. x 10, 12, 14 and 16 ft.
1 " " 336 in. x 10, 12, 14 and 16 ft.
1 " " 338 in. x 10, 12, 14 and 16 ft.
1 " " 340 in. x 10, 12, 14 and 16 ft.
1 " " 342 in. x 10, 12, 14 and 16 ft.
1 " " 344 in. x 10, 12, 14 and 16 ft.
1 " " 346 in. x 10, 12, 14 and 16 ft.
1 " " 348 in. x 10, 12, 14 and 16 ft.
1 " " 350 in. x 10, 12, 14 and 16 ft.
1 " " 352 in. x 10, 12, 14 and 16 ft.
1 " " 354 in. x 10, 12, 14 and 16 ft.
1 " " 356 in. x 10, 12, 14 and 16 ft.
1 " " 358 in. x 10, 12, 14 and 16 ft.
1 " " 360 in. x 10, 12, 14 and 16 ft.
1 " " 362 in. x 10, 12, 14 and 16 ft.
1 " " 364 in. x 10, 12, 14 and 16 ft.
1 " " 366 in. x 10, 12, 14 and 16 ft.
1 " " 368 in. x 10, 12, 14 and 16 ft.
1 " " 370 in. x 10, 12, 14 and 16 ft.
1 " " 372 in. x 10, 12, 14 and 16 ft.
1 " " 374 in. x 10, 12, 14 and 16 ft.
1 " " 376 in. x 10, 12, 14 and 16 ft.
1 " " 378 in. x 10, 12, 14 and 16 ft.
1 " " 380 in. x 10, 12, 14 and 16 ft.
1 " " 382 in. x 10, 12, 14 and 16 ft.
1 " " 384 in. x 10, 12, 14 and 16 ft.
1 " " 386 in. x 10, 12, 14 and 16 ft.
1 " " 388 in. x 10, 12, 14 and 16 ft.
1 " " 390 in. x 10, 12, 14 and 16 ft.
1 " " 392 in. x 10, 12, 14 and 16 ft.
1 " " 394 in. x 10, 12, 14 and 16 ft.
1 " " 396 in. x 10, 12, 14 and 16 ft.
1 " " 398 in. x 10, 12, 14 and 16 ft.
1 " " 400 in. x 10, 12, 14 and 16 ft.
1 " " 402 in. x 10, 12, 14 and 16 ft.
1 " " 404 in. x 10, 12, 14 and 16 ft.
1 " " 406 in. x 10, 12, 14 and 16 ft.
1 " " 408 in. x 10, 12, 14 and 16 ft.
1 " " 410 in. x 10, 12, 14 and 16 ft.
1 " " 412 in. x 10, 12, 14 and 16 ft.
1 " " 414 in. x 10, 12, 14 and 16 ft.
1 " " 416 in. x 10, 12, 14 and 16 ft.
1 " " 418 in. x 10, 12, 14 and 16 ft.
1 " " 420 in. x 10, 12, 14 and 16 ft.
1 " " 422 in. x 10, 12, 14 and 16 ft.
1 " " 424 in. x 10, 12, 14 and 16 ft.
1 " " 426 in. x 10, 12, 14 and 16 ft.
1 " " 428 in. x 10, 12, 14 and 16 ft.
1 " " 430 in. x 10, 12, 14 and 16 ft.
1 " " 432 in. x 10, 12, 14 and 16 ft.
1 " " 434 in. x 10, 12, 14 and 16 ft.
1 " " 436 in. x 10, 12, 14 and 16 ft.
1 " " 438 in. x 10, 12, 14 and 16 ft.
1 " " 440 in. x 10, 12, 14 and 16 ft.
1 " " 442 in. x 10, 12, 14 and 16 ft.
1 " " 444 in. x 10, 12, 14 and 16 ft.
1 " " 446 in. x 10, 12, 14 and 16 ft.
1 " " 448 in. x 10, 12, 14 and 16 ft.
1 " " 450 in. x 10, 12, 14 and 16 ft.
1 " " 452 in. x 10, 12, 14 and 16 ft.
1 " " 454 in. x 10, 12, 14 and 16 ft.
1 " " 456 in. x 10, 12, 14 and 16 ft.
1 " " 458 in. x 10, 12, 14 and 16 ft.
1 " " 460 in. x 10, 12, 14 and 16 ft.
1 " " 462 in. x 10, 12, 14 and 16 ft.
1 " " 464 in. x 10, 12, 14 and 16 ft.
1 " " 466 in. x 10, 12, 14 and 16 ft.
1 " " 468 in. x 10, 12, 14 and 16 ft.
1 " " 470 in. x 10, 12, 14 and 16 ft.
1 " " 472 in. x 10, 12, 14 and 16 ft.
1 " " 474 in. x 10, 12, 14 and 16 ft.
1 " " 476 in. x 10, 12, 14 and 16 ft.
1 " " 478 in. x 10, 12, 14 and 16 ft.
1 " " 480 in. x 10, 12, 14 and 16 ft.
1 " " 482 in. x 10, 12, 14 and 16 ft.
1 " " 484 in. x 10, 12, 14 and 16 ft.
1 " " 486 in. x 10, 12, 14 and 16 ft.
1 " " 488 in. x 10, 12, 14 and 16 ft.
1 " " 490 in. x 10, 12, 14 and 16 ft.
1 " " 492 in. x 10, 12, 14 and 16 ft.
1 " " 494 in. x 10, 12, 14 and 16 ft.
1 " " 496 in. x 10, 12, 14 and 16 ft.
1 " " 498 in. x 10, 12, 14 and 16 ft.
1 " " 500 in. x 10, 12, 14 and 16 ft.
1 " " 502 in. x 10, 12, 14 and 16 ft.
1 " " 504 in. x 10, 12, 14 and 16 ft.
1 " " 506 in. x 10, 12, 14 and 16 ft.
1 " " 508 in. x 10, 12, 14 and 16 ft.
1 " " 510 in. x 10, 12, 14 and 16 ft.
1 " " 512 in. x 10, 12, 14 and 16 ft.
1 " " 514 in. x 10, 12, 14 and 16 ft.
1 " " 516 in. x 10, 12, 14 and 16 ft.
1 " " 518 in. x 10, 12, 14 and 16 ft.
1 " " 520 in. x 10, 12, 14 and 16 ft.
1 " " 522 in. x 10, 12, 14 and 16 ft.
1 " " 524 in. x 10, 12, 14 and 16 ft.
1 " " 526 in. x 10, 12, 14 and 16 ft.
1 " " 528 in. x 10, 12, 14 and 16 ft.
1 " " 530 in. x 10, 12, 14 and 16 ft.
1 " " 532 in. x 10, 12, 14 and 16 ft.
1 " " 534 in. x 10, 12, 14 and 16 ft.
1 " " 536 in. x 10, 12, 14 and 16 ft.
1 " " 538 in. x 10, 12, 14 and 16 ft.
1 " " 540 in. x 10, 12, 14 and 16 ft.
1 " " 542 in. x 10, 12, 14 and 16 ft.
1 " " 544 in. x 10, 12, 14 and 16 ft.
1 " " 546 in. x 10, 12, 14 and 16 ft.
1 " " 548 in. x 10, 12, 14 and 16 ft.
1 " " 550 in. x 10, 12, 14 and 16 ft.
1 " " 552 in. x 10, 12, 14 and 16 ft.
1 " " 554 in. x 10, 12, 14 and 16 ft.
1 " " 556 in. x 10, 12, 14 and 16 ft.
1 " " 558 in. x 10, 12, 14 and 16 ft.
1 " " 560 in. x 10, 12, 14 and 16 ft.
1 " " 562 in. x 10, 12, 14 and 16 ft.
1 " " 564 in. x 10, 12, 14 and 16 ft.
1 " " 566 in. x 10, 12, 14 and 16 ft.
1 " " 568 in. x 10, 12, 14 and 16 ft.
1 " " 570 in. x 10, 12, 14 and 16 ft.
1 " " 572 in. x 10, 12, 14 and 16 ft.
1 " " 574 in. x 10, 12, 14 and 16 ft.
1 " " 576 in. x 10, 12, 14 and 16 ft.
1 " " 578 in. x 10, 12, 14 and 16 ft.
1 " " 580 in. x 10, 12, 14 and 16 ft.
1 " " 582 in. x 10, 12, 14 and 16 ft.
1 " " 584 in. x 10, 12, 14 and 16 ft.
1 " " 586 in. x 10, 12, 14 and 16 ft.
1 " " 588 in. x 10, 12, 14 and 16 ft.
1 " " 590 in. x 10, 12, 14 and 16 ft.
1 " " 592 in. x 10, 12, 14 and 16 ft.
1 " " 594 in. x 10, 12, 14 and 16 ft.
1 " " 596 in. x 10, 12, 14 and 16 ft.
1 " " 598 in. x 10, 12, 14 and 16 ft.
1 " " 600 in. x 10, 12, 14 and 16 ft.
1 " " 602 in. x 10, 12, 14 and 16 ft.
1 " " 604 in. x 10, 12, 14 and 16 ft.
1 " " 606 in. x 10, 12, 14 and 16 ft.
1 " " 608 in. x 10, 12, 14 and 16 ft.
1 " " 610 in. x 10, 12, 14 and 16 ft.
1 " " 612 in. x 10, 12, 14 and 16 ft.
1 " " 614 in. x 10, 12, 14 and 16 ft.
1 " " 616 in. x 10, 12, 14 and 16 ft.
1 " " 618 in. x 10, 12, 14 and 16 ft.
1 " " 620 in. x 10, 12, 14 and 16 ft.
1 " " 622 in. x 10, 12, 14 and 16 ft.
1 " " 624 in. x 10, 12, 14 and 16 ft.
1 " " 626 in. x 10, 12, 14 and 16 ft.
1 " " 628 in. x 10, 12, 14 and 16 ft.
1 " " 630 in. x 10, 12, 14 and 16 ft.
1 " " 632 in. x 10, 12, 14 and 16 ft.
1 " " 634 in. x 10, 12, 14 and 16 ft.
1 " " 636 in. x 10, 12, 14 and 16 ft.
1 " " 638 in. x 10, 12, 14 and 16 ft.
1 " " 640 in. x 10, 12, 14 and 16 ft.
1 " " 642 in. x 10, 12, 14 and 16 ft.
1 " " 644 in. x 10, 12, 14 and 16 ft.
1 " " 646 in. x 10, 12, 14 and 16 ft.
1 " " 648 in. x 10, 12, 14 and 16 ft.
1 " " 650 in. x 10, 12, 14 and 16 ft.
1 " " 652 in. x 10, 12, 14 and 16 ft.
1 " " 654 in. x 10, 12, 14 and 16 ft.
1 " " 656 in. x 10, 12, 14 and 16 ft.
1 " " 658 in

Special Notices.

New and Second-hand Machinery.

A "Wheelock" Automatic Cut-off Engine, 24x38 inch cylinder, in perfect order, with a pair of Horizontal Tubular Boilers, 5 x 17 ft., the plant complete now running.
A 20 x 36 "Wright" Automatic Cut-off Engine.
A 18 x 36 "Ward & Stanton" Automatic Cut-off Engine.
A 10 x 24 "Allure" Automatic Cut-off Engine.
A 13 x 16 "Whitehill" Adjustable Cut-off Engine.
A 14 x 24 "Ryder" Automatic.
A 20 x 54, 16 x 42, 15 x 36, 14 x 30, 13 x 16, 12 x 24, 11 x 24, 10 x 24, 9 x 20, 8 x 14, 8 x 16, 8 x 12, 8 x 10, 7 x 12, 6 x 10, 5 x 7, 4 x 6, 3 x 4, 2 x 3, 1 x 2, 1/2 x 1, 1/4 x 1/2, 1/8 x 1/4, 1/16 x 1/16, 1/32 x 1/32, 1/64 x 1/64, 1/128 x 1/128, 1/256 x 1/256, 1/512 x 1/512, 1/1024 x 1/1024, 1/2048 x 1/2048, 1/4096 x 1/4096, 1/8192 x 1/8192, 1/16384 x 1/16384, 1/32768 x 1/32768, 1/65536 x 1/65536, 1/131072 x 1/131072, 1/262144 x 1/262144, 1/524288 x 1/524288, 1/1048576 x 1/1048576, 1/2097152 x 1/2097152, 1/4194304 x 1/4194304, 1/8388608 x 1/8388608, 1/16777216 x 1/16777216, 1/33554432 x 1/33554432, 1/67108864 x 1/67108864, 1/134217728 x 1/134217728, 1/268435456 x 1/268435456, 1/536870912 x 1/536870912, 1/1073741824 x 1/1073741824, 1/2147483648 x 1/2147483648, 1/4294967296 x 1/4294967296, 1/8589934592 x 1/8589934592, 1/17179869184 x 1/17179869184, 1/34359738368 x 1/34359738368, 1/68719476736 x 1/68719476736, 1/137438953472 x 1/137438953472, 1/274877906944 x 1/274877906944, 1/549755813888 x 1/549755813888, 1/1099511627776 x 1/1099511627776, 1/2199023255552 x 1/2199023255552, 1/4398046511104 x 1/4398046511104, 1/8796093022208 x 1/8796093022208, 1/17592186044416 x 1/17592186044416, 1/35184372088832 x 1/35184372088832, 1/70368744177664 x 1/70368744177664, 1/140737488355328 x 1/140737488355328, 1/281474976710656 x 1/281474976710656, 1/562949953421312 x 1/562949953421312, 1/1125899906842624 x 1/1125899906842624, 1/2251799813685248 x 1/2251799813685248, 1/4503599627370496 x 1/4503599627370496, 1/9007199254740992 x 1/9007199254740992, 1/18014398509481984 x 1/18014398509481984, 1/36028797018963968 x 1/36028797018963968, 1/72057594037927936 x 1/72057594037927936, 1/144115188075855872 x 1/144115188075855872, 1/288230376151711744 x 1/288230376151711744, 1/576460752303423488 x 1/576460752303423488, 1/1152921504606846976 x 1/1152921504606846976, 1/2305843009213693952 x 1/2305843009213693952, 1/4611686018427387904 x 1/4611686018427387904, 1/9223372036854775808 x 1/9223372036854775808, 1/18446744073709551616 x 1/18446744073709551616, 1/36893488147419103232 x 1/36893488147419103232, 1/73786976294838206464 x 1/73786976294838206464, 1/147573952589676412928 x 1/147573952589676412928, 1/295147905179352825856 x 1/295147905179352825856, 1/590295810358705651712 x 1/590295810358705651712, 1/1180591620717411303424 x 1/1180591620717411303424, 1/2361183241434822606848 x 1/2361183241434822606848, 1/4722366482869645213696 x 1/4722366482869645213696, 1/9444732965739290427392 x 1/9444732965739290427392, 1/18889465931478580854784 x 1/18889465931478580854784, 1/37778931862957161709568 x 1/37778931862957161709568, 1/75557863725914323419136 x 1/75557863725914323419136, 1/151115727451828646838272 x 1/151115727451828646838272, 1/302231454903657293676544 x 1/302231454903657293676544, 1/604462909807314587353088 x 1/604462909807314587353088, 1/1208925819614629174706176 x 1/1208925819614629174706176, 1/2417851639229258349412352 x 1/2417851639229258349412352, 1/4835703278458516698824704 x 1/4835703278458516698824704, 1/9671406556917033397649408 x 1/9671406556917033397649408, 1/19342813113834066795298816 x 1/19342813113834066795298816, 1/38685626227668133590597632 x 1/38685626227668133590597632, 1/77371252455336267181195264 x 1/77371252455336267181195264, 1/154742504910672534362390528 x 1/154742504910672534362390528, 1/309485009821345068724781056 x 1/309485009821345068724781056, 1/618970019642690137449562112 x 1/618970019642690137449562112, 1/1237940039285380274899124224 x 1/1237940039285380274899124224, 1/2475880078570760549798248448 x 1/2475880078570760549798248448, 1/4951760157141521099596496896 x 1/4951760157141521099596496896, 1/9903520314283042199192993792 x 1/9903520314283042199192993792, 1/19807040628566084398385987584 x 1/19807040628566084398385987584, 1/39614081257132168796771975168 x 1/39614081257132168796771975168, 1/79228162514264337593543950336 x 1/79228162514264337593543950336, 1/158456325028528675187087900672 x 1/158456325028528675187087900672, 1/316912650057057350374175801344 x 1/316912650057057350374175801344, 1/633825300114114700748351602688 x 1/633825300114114700748351602688, 1/1267650600228229401496703205376 x 1/1267650600228229401496703205376, 1/2535301200456458802993406410752 x 1/2535301200456458802993406410752, 1/5070602400912917605986812821504 x 1/5070602400912917605986812821504, 1/10141204801825835211973625643008 x 1/10141204801825835211973625643008, 1/20282409603651670423947251286016 x 1/20282409603651670423947251286016, 1/40564819207303340847894502572032 x 1/40564819207303340847894502572032, 1/81129638414606681695789005144064 x 1/81129638414606681695789005144064, 1/162259276829213363391578010288128 x 1/162259276829213363391578010288128, 1/324518553658426726783156020576256 x 1/324518553658426726783156020576256, 1/649037107316853453566312041152512 x 1/649037107316853453566312041152512, 1/1298074214633706907132624082305024 x 1/1298074214633706907132624082305024, 1/2596148429267413814265248164610048 x 1/2596148429267413814265248164610048, 1/5192296858534827628530496329220096 x 1/5192296858534827628530496329220096, 1/10384593717069655257060992658440192 x 1/10384593717069655257060992658440192, 1/20769187434139310514121985316880384 x 1/20769187434139310514121985316880384, 1/41538374868278621028243970633760768 x 1/41538374868278621028243970633760768, 1/83076749736557242056487941267521536 x 1/83076749736557242056487941267521536, 1/166153499473114484112975882535043072 x 1/166153499473114484112975882535043072, 1/332306998946228968225951765070086144 x 1/332306998946228968225951765070086144, 1/664613997892457936451903530140172288 x 1/664613997892457936451903530140172288, 1/1329227995784915872903807060280344576 x 1/1329227995784915872903807060280344576, 1/2658455991569831745807614120560689152 x 1/2658455991569831745807614120560689152, 1/5316911983139663491615228241121378304 x 1/5316911983139663491615228241121378304, 1/10633823966279326983230456482242756608 x 1/10633823966279326983230456482242756608, 1/21267647932558653966460912964485513216 x 1/21267647932558653966460912964485513216, 1/42535295865117307932921825928971026432 x 1/42535295865117307932921825928971026432, 1/85070591730234615865843651857942052864 x 1/85070591730234615865843651857942052864, 1/170141183460469231731687303715884105728 x 1/170141183460469231731687303715884105728, 1/340282366920938463463374607431768211456 x 1/340282366920938463463374607431768211456, 1/680564733841876926926749214863536422912 x 1/680564733841876926926749214863536422912, 1/1361129467683753853853498429727072845824 x 1/1361129467683753853853498429727072845824, 1/2722258935367507707706996859454145691648 x 1/2722258935367507707706996859454145691648, 1/5444517870735015415413993718908291383296 x 1/5444517870735015415413993718908291383296, 1/10889035741470030830827987437816582766592 x 1/10889035741470030830827987437816582766592, 1/21778071482940061661655974875633165533184 x 1/21778071482940061661655974875633165533184, 1/43556142965880123323311949751266331066368 x 1/43556142965880123323311949751266331066368, 1/87112285931760246646623899502532662132736 x 1/87112285931760246646623899502532662132736, 1/174224571863520493293247799005065244265472 x 1/174224571863520493293247799005065244265472, 1/348449143727040986586495598010130488530944 x 1/348449143727040986586495598010130488530944, 1/696898287454081973172991196020260977061888 x 1/696898287454081973172991196020260977061888, 1/1393796574908163946345982392040521954123776 x 1/1393796574908163946345982392040521954123776, 1/2787593149816327892691964784081043908247552 x 1/2787593149816327892691964784081043908247552, 1/5575186299632655785383929568162087816495104 x 1/5575186299632655785383929568162087816495104, 1/11150372599265311570767859136324175632990208 x 1/11150372599265311570767859136324175632990208, 1/22300745198530623141535718272648351265980416 x 1/22300745198530623141535718272648351265980416, 1/44601490397061246283071436545296702531960832 x 1/44601490397061246283071436545296702531960832, 1/89202980794122492566142873090593405063921664 x 1/89202980794122492566142873090593405063921664, 1/178405961588244985132285746181186810127843328 x 1/178405961588244985132285746181186810127843328, 1/356811923176489970264571492362373620255686656 x 1/356811923176489970264571492362373620255686656, 1/713623846352979940529142984724747240511373312 x 1/713623846352979940529142984724747240511373312, 1/1427247692705959881058285969449494481022746624 x 1/1427247692705959881058285969449494481022746624, 1/2854495385411919762116571938898988962045493248 x 1/2854495385411919762116571938898988962045493248, 1/5708990770823839524233143877797977924090986496 x 1/5708990770823839524233143877797977924090986496, 1/11417981541647679048466287755595955848181972992 x 1/11417981541647679048466287755595955848181972992, 1/22835963083295358096932575511191911696363945984 x 1/22835963083295358096932575511191911696363945984, 1/45671926166590716193865151022383823392727891968 x 1/45671926166590716193865151022383823392727891968, 1/91343852333181432387730302044767646785455783936 x 1/91343852333181432387730302044767646785455783936, 1/182687704666362864775460604089535293570911567872 x 1/182687704666362864775460604089535293570911567872, 1/365375409332725729550921208179070587141823135744 x 1/365375409332725729550921208179070587141823135744, 1/730750818665451459101842416358141174283646271488 x 1/730750818665451459101842416358141174283646271488, 1/1461501637330902918203684832716282348567292542976 x 1/1461501637330902918203684832716282348567292542976, 1/2923003274661805836407369665432564697134585085952 x 1/2923003274661805836407369665432564697134585085952, 1/5846006549323611672814739330865129394269170171904 x 1/5846006549323611672814739330865129394269170171904, 1/11692013098647223345629478661730258788538340343808 x 1/11692013098647223345629478661730258788538340343808, 1/23384026197294446691258957323460517577076680687616 x 1/23384026197294446691258957323460517577076680687616, 1/46768052394588893382517914646921035154153361375232 x 1/46768052394588893382517914646921035154153361375232, 1/93536104789177786765035829293842070308306722750464 x 1/93536104789177786765035829293842070308306722750464, 1/187072209578355573530071658587684140616613445500928 x 1/187072209578355573530071658587684140616613445500928, 1/374144419156711147060143317175368281233226891001856 x 1/374144419156711147060143317175368281233226891001856, 1/748288838313422294120286634350736562466453782003712 x 1/748288838313422294120286634350736562466453782003712, 1/1496577676626844588240573268701473124932907564007424 x 1/1496577676626844588240573268701473124932907564007424, 1/2993155353253689176481146537402946249865815128014848 x 1/2993155353253689176481146537402946249865815128014848, 1/5986310706507378352962293074805892499731630256029696 x 1/5986310706507378352962293074805892499731630256029696, 1/11972621413014756705924586149611784999463260512059392 x 1/11972621413014756705924586149611784999463260512059392, 1/23945242826029513411849172299223569998926521024118784 x 1/23945242826029513411849172299223569998926521024118784, 1/47890485652059026823698344598447139997853042048237568 x 1/47890485652059026823698344598447139997853042048237568, 1/95780971304118053647396689196894279995706084096475136 x 1/95780971304118053647396689196894279995706084096475136, 1/191561942608236107294793378393788559991412168192950272 x 1/191561942608236107294793378393788559991412168192950272, 1/383123885216472214589586756787577119982824336385900544 x 1/383123885216472214589586756787577119982824336385900544, 1/766247770432944429179173513575154239965648672771801088 x 1/766247770432944429179173513575154239965648672771801088, 1/1532495540865888858358347027150308479931297345543602176 x 1/1532495540865888858358347027150308479931297345543602176, 1/3064991081731777716716694054300616959662594691087204352 x 1/3064991081731777716716694054300616959662594691087204352, 1/6129982163463555433433388108601233919325189382174408704 x 1/6129982163463555433433388108601233919325189382174408704, 1/12259964326927110866866776217202467838650378764348817408 x 1/12259964326927110866866776217202467838650378764348817408, 1/24519928653854221733733552434404935677300757528697634816 x 1/24519

page 63 of their catalogue, inform us that they will soon put on the market a Bolt Clipper of a larger size than the one they are now making, suitable for cutting 1/2-inch bolts. The present Clipper, to which they refer as an exceedingly useful tool, and having large and increasing sale, cuts a 3/4-inch bolt. This house also make a specialty of Wrought Body Corner Irons for the top edges of carriage bodies, and mention that they turn out 10,000 dozen sets of these during a year. These, they mention, are cut from sheets which they buy in carload lots in Pittsburgh, and are finished by machinery built for this special purpose and in their own shop.

The J. E. Bonebrake Hardware Company, Abilene, Kan., have issued a catalogue of the goods in which they deal, covering an extensive line, as it includes Hardware, Agricultural Implements, Buggies, Groceries, Wagons, &c. The cover contains a cut representing their store in 1871, and another showing it in its present imposing dimensions. This publication is an indication of the development of Kansas and the enterprise of this house.

Our readers will remember that we recently referred to the destruction by fire of the factory of the

BISSELL CARPET SWEEPER COMPANY,

Grand Rapids, Mich. We are glad now to be able to announce that they are again in good shape and ready to receive the orders of the trade. In a recent circular they mention that they have taken possession of the factory of the Michigan Carpet Sweeper Company, and another with double its capacity, so that they have now in the two factories as great capacity as before the fire. One of these factories they are running night and day with two sets of men, and they are making preparations for the speedy rebuilding of their former establishment. They have purchased, they inform us, the entire business of the Michigan Carpet Sweeper Company and the Grand Rapids Sweeper Company, whose goods will receive their special attention and be perfected as far as possible. They add that their business will receive the personal attention and supervision of M. R. Bissell, assisted by Charles B. Judd, who has largely been identified with the trade for several years as manager of the Grand Rapids Sweeper Company. They indicate that they are ready to receive the orders of the trade, which they hope to be able to fill satisfactorily and at an early day. Their office in this city is with T. W. Williams, at 46 Murray street.

JAMES AIKMAN & CO.

The following is the revised price list issued by James Aikman & Co., New York, for the Stamped Trimmings of which they are the manufacturers. It is subject to a discount of 65 and 2 per cent. for cash:

Breasts and Covers, Tea Pot—Oval, Hinged, Retinned.									
Nos.	111	112	113	114	115	116			
Per gross	\$13.50	15.00	16.00	17.40	19.30	21.30			
Breasts and Covers, Tea Pot—Round, Plain.									
Nos.	32	33	34	35	36				
Per gross	\$6.25	6.75	7.65	9.00	10.25				
Breasts and Covers, Tea Pots—Round, Plain; Edges Turned on Breasts.									
Nos.	132	133	134	135	136				
Per gross	\$6.60	7.50	8.10	9.00	10.25				
Breasts and Covers, Tea Pot—Round, Plain Rimmed Covers.									
Nos.	142	143	144	145	146				
Per gross	\$7.20	7.80	8.40	9.00	10.80				
Breasts and Covers, Tea Pot—Round, Retinned, Rimmed Covers.									
Nos.	152	153	154	155	156				
Per gross	\$11.75	12.60	14.00	15.50	17.00				
Breasts and Covers, Tea Pot—Spun.									
Nos.	162	163	164	165	166				
Per gross	\$11.75	12.60	14.00	15.50	17.00				
Breasts and Covers, Tea Pot—Spun, Rimmed, Hinged.									
Nos.	172	173	174	175	176				
Per gross	\$14.00	15.50	16.50	18.00	20.50				
Breasts and Covers, Tea Pot—Spun, Rimmed, Not Hinged.									
Nos.	182	183	184	185	186				
Per gross	\$11.75	12.60	14.00	15.50	17.00				
Bell-Shaped Covers—Spun.									
Pints.	1	2	3	4	5	6 or 8			
Per gross	\$7.20	9.00	10.00	12.00	13.20	14.40			
Breasts, Tea Kettle, Tin.									
Inches.	7 1/2	8	8 1/2	9					
Without Covers, per gross	\$9.00	9.90	10.35	11.70					
With Plain Covers, " "	11.40	12.60	13.20	15.30					
With Rim'd Cov., " "	13.20	14.40	15.45	17.40					
Inches.	9 1/2	10	10 1/2	11					
Without Covers, per gross	\$12.40	14.40	15.00	17.00					
With Plain Covers, " "	15.00	16.00	17.00	19.00					
With Rim'd Cov., " "	17.00	18.00	19.00	21.00					
Inches.	11 1/2	12	12 1/2	13					
Without Covers, per gross	\$22.50	25.30	27.60						
With Plain Covers, " "	25.40	28.50	31.20						
With Rim'd Cov., " "	28.50	32.10	34.50						
Breasts, Tea Kettle, Copper—Patented Rimmed Cover and Knob, Stamped of One Piece.									
Inches.	8 1/2	9	9 1/2	10	10 1/2	11	11 1/2		
Per doz.	\$12.30	13.30	13.80	14.40	15.00	15.60	16.20		
Copper Tea Kettle Trimmings—Complete.									
Nos.	6	7	8	9					
Per dozen sets	\$25.00	30.00	31.50	33.00					
Faced in neat boxes of half-dozen									
Tea Kettle Handles and Ears.									
Inches.	7	8	9	10	7 to 8	9 to 10			
Per doz.	\$1.25	1.35	1.50	1.75					
Bottoms, Steamer.									
Inches.	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2
Per gross	\$11.70	12.30	13.30	14.30	15.30	16.30	17.30	18.30	19.30
Inches.	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2
Per gross	\$16.30	17.30	18.30	19.30	20.30	21.30	22.30	23.30	24.30
Bottoms, Round (IX, Ex. Deep), Tin Tea Kettle.									
Inches.	8	9	10	11					
Per gross	\$14.40	16.00	17.60	19.20					
Bottoms, Wash-Bowl.									
Inches.	Small.	Regular.	Copper.						
IX, per gross	\$4.25	5.75	6.25						
IX, per gross	5.10	7.50	8.00						
Covers, Oval Boiler, Flat Edge—IX.									
Nos.	6	7	8	9					
Per doz.	\$3.00	3.50	4.00	4.50					
Covers, Oval Boiler, Rimmed Edge—IX.									
Nos.	6	7	8	9					
Per doz.	\$3.50	4.00	4.50	5.00					

Covers, Bucket—Eastern Pattern.

Pts.	1	2	3
Per gross	\$3.30	3.90	4.60
Qts.	2	3	4
Per gross	\$5.40	6.20	7.00

Western Pattern.

Pts.	1	2	3
Per gross	\$3.90	4.50	5.10
Qts.	2	3	4
Per gross	\$6.20	7.00	7.80

Covers, Cake Box.

Inches.	11 1/2	12 1/2	13 1/2
Per gross	\$22.40	27.60	32.80

Covers, Bucket, Oval or Butter Kettle.

Pts.	1	2	3
Per gross	\$7.20	9.00	10.80

Covers, Coffee Pot.

Qts.	1	2	3
Per gross	\$1.80	2.10	2.40

Covers, Rimmed.

Inches.	2 1/2	3 1/2	4 1/2
Per gross	\$3.00	3.60	4.20

Covers, Pot, Common.

Inches.	7	7 1/2	8
Per gross	\$6.90	7.50	8.10

Covers, Pot, Ringed, Edges Hemmed.

Inches.	9	9 1/2	10
Per gross	\$13.50	14.10	14.70

Chamber Pot Trimmings.

Qts.	Small.	Medium.	Large.
Per gross	\$3.00	3.40	3.80

Coffee Boiler Lips—To Rivet.

Inches.	Small.	Large.
Per gross	\$1.50	1.80

Candle Mold Pans.

Hole.	3	4	5
Per gross	\$2.70	3.00	3.30

Candle Mold Tips.

Inches.	Small.	Large.
Per gross	\$0.50	.50

Candle Mold Tubes (Tins In).

Inches.	Small.	Large.
Per gross	\$5.40	6.00

Closet Doors.

Inches.	Small.	Medium.	Large.
Per doz.	\$1.15	1.25	1.35

Fruit Can Tops and Bottoms.

Qts.	Small.	Large.
Per gross	\$5.75	6.00

Funnel Tubes, Fluted.

Nos.	1	2	3
Per gross	\$1.10	1.45	1.80

Grater Blanks, either Diamond or Round Pattern Sheet.

Per gross	\$3.90	7.50	15.00
-----------	--------	------	-------

Nozzles, Can.

Inches.	1	1 1/2	2
Per gross	\$1.30	1.50	1.80

Nozzles and Corks.

Inches.	1	1 1/2	2
Per gross	\$4.30	4.50	5.40

Pan Studs or Canopies.

Inches.	1 1/2	2 1/2	3 1/2
Per gross	\$4.35	5.35	6.35

Stove-Pipe Rings.

Inches.	4	4 1/2	5
Per gross	\$4.50	5.25	6.00

Spouts, Tea Pot, Fluted.

Nos.	1	2	3
Per doz.	\$7.50	8.50	9.50

Spouts, Tea Kettle, Stamped.

Per doz.	\$1.35	2.00
----------	--------	------

Spouts, Can, Bent.

Nos.	1	2	3
Per gross	\$1.10	2.00	3.00

Spouts, Engineer, Can—6 inches, per gross—\$4.00

IRON.

American Pig.—In this market sales have been made during the past week of Foundry Iron to the extent of 4000 to 5000 tons, of Gray Forge Iron exceeding 4500 tons, and of Bessemer Iron from 7000 to 10,000 tons. The Foundry Iron was mainly sold at full prices. In a few cases a slight concession may have been made, while in others better prices have been obtained than those recently ruling. Of the Gray Forge Iron, a 1000-ton lot was sold at \$18, 4 months, tidewater delivery, and a 3000-ton lot was sold at a shade under \$17 at furnace by a company whose agent says he has no more to sell at that price. The Bessemer Iron was sold on private terms. The sales referred to were made by a few companies either direct to the consumer or through their agents. Dealers report only the usual run of small lots, ranging from 10 to 100 tons, and they found the week in all respects similar to its predecessors. The principal companies represented in this market are selling very little iron, having little or none to sell, but are making heavy deliveries on old contracts. The quantity of iron sold in this way, however, does not represent the average melting capacity of this section, even including the weekly sales made by other agencies since the opening of the year. The consumption of Pig Iron is therefore believed to be abnormally contracted, and many careful observers are anticipating a reaction in this respect. As manufacturers are evidently not accumulating stocks at the furnaces, producing no more iron than can be absorbed by the current demand, it would take a very slight movement in the direction of increased consumption to stiffen prices and even to start them upward. Several elements now combine to unduly depress trade, and the removal of one or two of them, which may happen at any time, would exercise a beneficial effect. The strength

with which prices are held is noted by purchasers, who acknowledge that they are unable to secure lower rates than those prevailing a month ago, although they make every effort to obtain substantial concessions. Quotations for standard Lehigh brands range about as follows for tidewater delivery: No. 1 X Foundry, \$20 @ \$21, with retail lots and a few special brands selling at from 50¢ to \$1 higher; No. 2 X Foundry, \$18.50 @ \$19.50; Gray Forge, \$17.50 @ \$18.50.

Scotch Pig.—We are reported sales of a little more than 500 tons in the aggregate. Dullness is the ruling feature. Arrivals during the week footed up some 1500 tons, almost all of which had been sold previous to shipment or afloat. A small quantity was sold on dock at a concession to avoid storage. Very few of these irregular sales occur now, however, as the number of importers has been greatly narrowed. No. 1 Irons are quoted as follows: Gartsherrie, \$22.50 @ \$23 from yard, \$21.75 to arrive; Shotts, \$22.50; Langloan, \$22.25 @ \$22.50; Carnbroe and Glengarnock, \$22.50 from yard, and \$22 to arrive; Coltness, \$22 @ \$22.50; Summerlee, \$21.75; Dalmellington, \$20.75; Clyde, \$20.50; Eglinton, \$20.25 to arrive.

Bessemer Pig.—No transactions are reported in Foreign, which is quoted nominally at \$20.50, ex-ship.

Spiegel Eisen.—Some 2000 tons of 20 % were sold during the past week, and negotiations are pending for more. Quotations of 20 % are \$25 @ \$28.50, and 30 % is held at \$32.

Bar Iron.—Some sales of mill lots have been made during the week, but trade generally has not been active. Rumors of very low prices are prevalent, though it is doubtful if some of the iron sold for Best Refined would come up to the full Eastern standard. A few sales are reported at comparatively good prices, but only in cases where buyers desired a good quality. Several carloads of Best Refined were sold at 1.95¢, delivered on dock, but the seller now asks 2¢, and refuses to take less. Western freights still continue low, and as long as they remain low there will be an unsettled market here for Bar Iron, unless in the meantime the Western demand revives sufficiently to absorb the output of Western mills at home. Among the sales reported during the week is one of 1000 tons of Hoops. Store trade shows very little improvement. Prices are nominally as follows: Best Refined, at mill, 1.8¢ @ 2.05¢; from store, 2.1¢ @ 2.25¢; Common Iron, at mill, 1.7¢ @ 1.75¢; from store, 2¢ @ 2.1¢.

Structural and Shaped Iron.—Some orders have been entered during the past week, but no large transactions are reported. We quote prices as follows: Angles, 2.4¢ @ 2.6¢ from store; Tees, 2.9¢ @ 3¢ from store; Beams and Channels, 3.5¢ on wharf for round lots.

Plate Iron.—This branch of the trade is looking up a little, more business being reported, though prices show no improvement. We quote nominally as follows: Common or Tank, 2.4¢ @ 2.6¢; Refined, 2.7¢ @ 2.75¢; Shell, 3¢; Flange, 3 1/4¢ @ 4¢; Extra Flange, 4 1/2¢ @ 5¢.

Sheet Iron.—Inquiries are more frequent, but actual business is slow. Prices are nominal, ranging upward from 2.8¢ to 3.1¢ for Nos. 10 to 16. Lighter sizes are quoted in our New York Wholesale Price List.

Merchant Steel.—More business is being done in the lower grades, but no change is apparent as yet in the demand for the best qualities. Plates are in good request. We quote as follows: American Tool Steel, 10 1/2¢, with a concession to large buyers; Crucible Machinery, 6 1/2¢ @ 7¢; Bessemer and Open-hearth Machinery, 3 1/4¢ @ 4¢; Tank Steel, 4¢; Boiler Plates, 4 1/2¢ @ 5¢, with extra for special sizes; English Tool, 15 1/2¢.

Steel Rails.—We are reported sales aggregating 20,000 tons. Of these, 6000 tons were sold by a Western mill on private terms, and 1500 tons by a Western Pennsylvania mill at \$35.50 at mill, cash, for a standard section. The other sales were made by Eastern mills at the rates recently prevailing, except a 500-ton lot of second-hand 40-pound Rails which was sold at \$32, delivered at a point in Massachusetts. Included in the above sales was a 500-ton lot of 30-pound Rails, which was sold at \$30, delivered also at a point in Massachusetts. The inquiry for Rails is improving, especially for summer delivery. Some very good orders are in sight, and it is believed they will, undoubtedly, soon be placed. Not many of the mills now in operation are prepared to take orders for such delivery, and, consequently, prices are stiffer. We quote \$33 @ \$34 at Eastern mill for ordinary sections of Steel Rails, according to quantity and time of delivery.

Steel Billets.—Considerable business has been recently transacted in Billets for Wire-drawing and Bar-rolling. During the past two weeks sales have aggregated over 10,000 tons. Billets of special carbon command as high as \$47.50 per ton at works, while ordinary 4 x 4 inch Billets are quoted at \$37 @ \$38, delivered. Wire Billets are sold at an equally wide range, according to quality.

Wire Rods.—A fair volume of trade characterized the past week. The demand for Steel Rods is quite steady, particularly for spot lots, and Iron Rods are moving more freely than they were some few weeks back. Steel Rods are still quoted at \$48 @ \$50, ex-

ship, according to quantity, quality and time of delivery. Coke Iron Rod

they get through with former engagements. Quotations may be fairly given as follows:

Gray-Forge Neutral	17.00 @ 17.50, 4 mos.
All-Forge	18.00 @ 19.00, 4 "
Red Short Mill	18.00 @ 19.00, 4 "
White and Mottled	16.00 @ 16.50, 4 "
Foundry Grades	18.00 @ 20.00, 4 "
Foundry, Charcoal	22.00 @ 24.00, 4 "
Cold Blast, Charcoal	20.00 @ 22.00, 4 "
Bessemer Iron	20.00 @ 20.50, 4 "

There have been sales of Bessemer Iron as low as \$19.50, cash, and \$20.4 months, and it is said that there is no trouble in buying at figures quoted.

Muck Bar.—There have been no sales reported during the past week, in the absence of which we continue to quote at \$31, cash.

Manufactured Iron.—Trade continues backward and unsatisfactory, and the prospect for an improvement is not very encouraging; both jobbers and consumers are buying sparingly, and the only hope now is that the very light spring trade will cause an improved business through the summer. About the only favorable feature to note is the fact that stocks in the hands of both jobbers and consumers are very much reduced, and the summer trade may be larger than usual in consequence. Prices are still quoted on a basis of 1.75¢ @ 1.85¢ for Bars, according to size and character of orders. The Valley Mills, it is claimed, are selling, delivered at points West, at equal to 1.6¢ @ 1.65¢ rates at home. Those mills making a specialty of Bridge and Structural Iron are reasonably well employed, but none of the Bar mills are working full.

Nails.—The "pool" noted in our dispatch of last week has been perfected and has gone into effect, and it is believed will be productive of much good. It is to be expected that large buyers will hold off for a time, to see how the new arrangement works, but, once satisfied that it is going to be a success, they will at once fall in. Prices remain unchanged at \$2.35 @ \$2.40, 60 days, 2¢ off for cash, in car lots, and 5¢ @ 10¢ keg additional in a jobbing way.

Wrought Iron Pipe.—Trade is a little more active, but continues short of what it usually is at this season of the year. It is intimated that some manufacturers are becoming dissatisfied with the present condition of affairs, and argue that there should be a change made in prices. We repeat former quotations: Discount on Black Butt-Welded Pipe in carload lots, 30%; less than carload, 27½%; on Galvanized, carload lots, 20%; less, 17½%; on Black Lap-Welded Pipe, in car lots, 50%; less, 47½%; on Galvanized do., 35 and 32½%; Pipe cut to specified length, the discount is 5% less.

Steel.—The demand continues light for the season, but all possibly that can be expected under existing circumstances. Prices remain unchanged. Best brands of Refined Cast Steel, 9½¢; do. Crucible Machinery, 5¢; Open-Hearth and Bessemer do., 3¼¢ @ 3½¢.

Old Rails.—There is still some inquiry, and prices are steady. Brokers say that the offerings are light and the tone of the market steady. We can report sales in small lots of some 100 tons, all at \$23.50, which may be regarded as the ruling quotation.

Steel Rails.—The market is still reported dull; no recent sales and but little inquiry; however, makers here are still holding for \$35 cash at mill, and are, it is said, refusing to sell for less. Orders are being held back in expectation of lower prices.

Railway Track Supplies.—The demand for everything in this line continues backward, with prices weak, but unchanged. Spikes, 2½¢, 30 days; Splice Bars, 1.75¢ @ 1.8¢, Track Bolts, 2¼¢ @ 3¢.

Crop Ends.—Sales have been made during the past week at \$20, cash, at mill, which is the lowest point yet touched.

Scrap.—The demand for all kinds of Scrap continues light, and prices are weak, but without quotable change. No. 1 Wrought Scrap, \$20 @ \$21 per net ton; Old Car Axles, \$29 @ \$30; Wrought Turnings, \$16 @ \$18; Cast Boring, \$13 @ \$14, gross; Old Car Wheels, nominal, \$18 @ \$19.

Window Glass.—There is an increasing demand, and manufacturers begin to feel encouraged in the belief that there is to be a good summer trade. Prices remain unchanged. Discounts on Single Strength, in car lots, 60 and 20%; on Double Strength, 70 and 5%.

Coke.—The general position of the market remains unchanged; demand all that can be expected in view of the depressed condition of the Iron trade. Prices same as last quoted—\$1.10 per ton, free on cars, at ovens.

CHICAGO.

Office of The Iron Age, 36 and 38 Clark St., (Cor. Lake St., Chicago, April 14, 1884.)

Hardware.—The Hardware trade is running along very satisfactorily for the season. The demand is equal to similar periods in former years, though goods are taken in smaller quantities, consistent with the teaching of the past year or two. Where formerly heavy stocks were sold at the opening of spring trade, dealers are now contenting themselves with much lighter orders, covering present consumption only, and renewing the order as demand may require. The aggregate shipments make fair footings, but the extra labor in getting out the business diminishes the profits within a minimum of the cost, and extraordinary sales are necessary to make the Hardware business under these conditions lucrative, notwithstanding the fact that prices are generally firm, while in a few instances an advance could be cited. The trade all through bears evidence of being in a healthy state at present. The most saleable articles are Farming Implements from a Hoe to a Plow, including the line of Rakes, Forks, &c. Shelf Hardware and Blacksmith Tools are also in good demand. Barb Wire is in strong demand, though the recent advance has checked orders temporarily. We quote Painted Four-point, 5¢, and Five-point, 5¼¢, and 1¢ extra for Galvanized.

Nails.—Notwithstanding the movement of manufacturers to form a syndicate for pooling the Nail product and regulating the price last week, the market has shown no disposition of uneasiness, nor has the demand been anything except for the most

pressing necessity. The demand is that of regular consumption, and is not stronger than is customary at this season of the year. Carload lots are quoted at \$2.50, but the infrequency of sales in this quantity makes the quotation almost nominal. From store and in lots ranging from 10 to 50 kegs we quote \$2.55 @ \$2.60, which appears to be pretty near bottom at this writing. Should the proposed syndicate be consummated, the price on Nails will certainly go from 15¢ to 25¢ per keg higher.

Ore.—The Ore market during the week has been quiet, but no weakness is visible. It is said that 1,700,000 tons of a probable product of 2,100,000 tons have been contracted for at lower figures, and the demand is so sluggish that there is little chance of losing a sale by holding firm at \$6.50 on dock, as per Republic Ore Company's quotation.

American Pig Iron.—The indications are that the Pig Iron interests have suffered more or less during the month of March and the first half of this month. The hopeful feeling which producers entertained in the earlier part of the year has vanished. In the meantime the demand has been, in a small way, pretty steady, with an occasional 10 or 15 carload order, bringing no features to the front that have made an advance possible nor compelled a decline. In this both dealer and consumer have been disappointed. With the exception of a decline of 50¢ per ton on several of the less important grades, which had been discounted by sellers privately several weeks ago, we continue our quotations as follows for carload lots, 4 months, with a possible discount of 50¢ for cash: Lake Superior Charcoal, Nos. 1, 2 and 3, at \$22 @ \$23; Nos. 4, 5, and 6 at \$24; Lake Superior Coke at \$21 @ \$22.50; Lake Superior and Ohio, mixed, at \$21; Ohio Standard Black Band, No. 1, \$21 @ \$22; Southern, No. 1, at \$20, and No. 2 at \$19; Silvery Soft at \$19 @ \$21; Anthracite, No. 1, at \$22, and No. 2 at \$21.

Scotch Pig.—The market for Scotch Iron is dull and devoid of interest except what is centered in the declining figures caused by the simple desire of dealers to get rid of the stock because of its non-saleability. A prominent Stove manufacturer, pointing to a lot of Ohio Black Band in his yard, remarked, in answer to our query, "There is our Scotch Iron," and in this expression may be found the true cause of the lack of business in foreign Iron. We quote Summerlee at \$26.50 and Gleggarnock at \$27—prices subject to influence of quantity and buyer.

Merchant Steel.—The element which has wrought various prices upon the Steel market and distracted the trade has thus far failed to move business. The demand for the lower grades does not improve, and each attempt to place an order of any consequence results in further concessions by sellers. Cutting prices has been carried to such an extent that some of the high standard brands have been drawn into the competition for orders, and, in order to meet the price, the quality of the Steel is being sacrificed. Mills who are unwilling to cut their rates and sustain their grades report a fair trade for the best qualities of Tool and Machinery Steel, which comes principally from the fact that it is giving a monopoly to a few manufacturers who have been able to keep out of the decline. Business does not move in accordance with the season, and the outlook is worse, if anything, than a month ago. We make the following quotations for the Best Refined grades:

	Per pound.
Best Refined Cast Tool Steel	94 @ 10¢
Crucible Cast Machinery Steel	94 @ 94¢
Open-Hearth Machinery Steel	94 @ 94¢
Bessemer Machinery Steel	94 @ 94¢
Open-Hearth Spring Steel	94 @ 94¢
Toe-Calk Steel	94 @ 94¢
Bessemer Steel	94 @ 94¢
Cast Plow Steel	94 @ 94¢
German Plow Steel	94 @ 94¢
Synde Steel	94 @ 94¢
Fire-Box and Boiler Steel	94 @ 94¢

Steel Rails.—The market is quiet, and few inquiries and fewer sales are being made. Chicago mills report that there are no contracts in the market at present prices, and all business, or nearly so, that comes in is on contracts placed several months ago. For new orders mills are asking \$37 @ \$39, which does not seem inviting to those contemplating buying, if any such exist.

Old Rails.—The market for Old Rails is firm at \$19.50 @ \$21, Chicago or Milwaukee delivery. Old Rails are scarce, and most of the stock is in the hands of dealers, who are asking from \$1 to \$2 per ton more than purchasers are willing to pay.

Bar Iron.—The Bar Iron market is fairly active. For the best quality orders for small lots have been very free, while the carload trade is steadily improving. New Puddled Best Refined commands \$2 @ \$2.10 from store, and about ¼¢ less for large buyers. The Bar Iron trade does not seem to be the least influenced by the uncertain condition of some of the other Irons. The stiffness in Old Rails is disturbing the price on Common Iron, which has been very low and irregular.

Norway Bars.—The conditions of this branch of trade remain about the same as at our last report. There has been nothing to change the status, and trade has not undergone any improvement. We quote from store, 4¢ rates, with a concession of 1½¢ to merchant trade.

Structural Iron.—The improvement in this class of Iron is very gradual. Some contracts and orders are being placed, most of which are for immediate delivery, while the bulk of trade in prospect is followed closely by the various competitors. We quote as follows from mill: Beams, \$3.60; Channels, \$3.60; T Iron, \$3; Angle Iron, \$2.50; Flitch Plates, \$2.50; Frieze Plates, \$2.70. From store, ¼¢ @ ½¢ extra.

Galvanized Iron.—The building prospect has revived the Galvanized Iron trade, particularly among the cornice-makers. The demand is considerably better than a month ago for some brands, while for others there is no change. The discrimination and preference exhibited by buyers strengthens the antagonism of manufacturers which has for some time been prevalent, from envy rather than from business interests, and is the main cause for much of the cutting in prices and the generally demoralized condition of the market. We continue former quotations, as follows: Juniata, 50 and 5¢ off, and Refined at 55 and 5¢ off.

Black Sheets.—Nothing new and the market exceedingly dull. Prices remain as heretofore, as follows: Nos. 10 to 14 at \$2.60 @ \$2.70; No. 24 at \$3.20; Nos. 25 and 26 at \$3.30, and No. 27 at \$3.40.

Scrap Iron.—Mills are quoting \$17 @ \$18 for Chicago or Milwaukee delivery; stock plenty and of medium quality. We make the following quotations, which are dealers' purchasing prices: No. 1 Wrought Scrap, per net ton, \$17; Cast Scrap, per net ton, \$14; No. 1 Stove Plate Scrap, per net ton, \$9; Wrought Turnings, per ton, \$8; Cast-Iron Boring, \$7; Old Plow Steel, \$10; Tool Steel, per ton, \$19; Steel Tire, per net ton, \$15; Buggy Springs, per net ton, \$18; Malleable Scrap, \$5.

Old Car Wheels.—While there is a fair demand for Old Wheels, the market is not active, because holders are unwilling to accept the prices bid—\$18 @ \$19—and purchasers claim that they cannot pay more. Sales of several thousand tons are reported at private figures.

CHATTANOOGA.

Office of The Iron Age, Carter and Ninth Sts., CHATTANOOGA, April 14, 1884.

Business throughout the Southern district is fair for the season, considering this is a year of general low prices. The weather during the past week has been raw and cold. Frosts fell nearly down to the Gulf coast, in some localities somewhat injuring the fruit, but the damage in this regard is greatly overestimated. The exceptional activity in the building trades continues, and is a strong factor of support for general commercial and industrial business. Spring trade in merchandise promises rather light sales. Cotton is strong, and a rise to 12¢ per lb for spot Middling Uplands is probable before the middle of May. Many extensions of old, and building of new, industrial concerns are in progress or have been projected.

Pig Iron.—There is nothing new to report in the Southern market. Short-time contracts for near-by delivery of 1000-ton lots and upward continue at \$14.70 @ \$15 for No. 1 Mill; No. 1 Foundry, \$17. We quote for small lots to consumers, 60 days: No. 1 Foundry, \$18 @ \$19; No. 2 Foundry, \$16 @ \$17; Gray Forge, \$15 @ \$16; White and Mottled, \$14 @ \$15; Car-Wheel Metal, \$23 @ \$24.

Ores.—We quote 50¢ Brown Hematite, per ton, \$1.75 @ \$2; Red Fossil, \$1.50 @ \$1.75, delivered at furnace.

Miscellaneous Articles.—Old Rails are dull at \$21, \$1 below last quotation. Scrap are dull and nominal. Wrought Scrap, \$15 @ \$16; Cast Scrap, \$11 @ \$14; Old Wheels nominal, \$18 @ \$20.

Nails.—Are steady at \$2.50 for carloads, usual deduction for cash. Job lots, 10¢ @ 15¢ higher.

Merchant Iron.—Bar Iron is steady but dull at \$1.85 for round assorted lots. Bolts, \$2.80 @ \$3 for Square and Hexagon Heads; Spikes, \$2.35; Splices, \$1.90.

Coal.—We quote Fancy Lump Coal at \$3; Common, \$2.50; run of mine to manufacturers, \$1.50 @ \$1.75 at mills.

Coke.—We quote at \$2 @ \$2.20 at furnace; Foundry Coke at 8¢ @ 10¢ per bushel.

Barbed Wire.—We quote Four-Point Galvanized, 6¢ per lb; Cambria Link, 6¢ per lb.

CINCINNATI.

APRIL 14, 1884.—**Pig Iron.**—Consumers buy only as needed for present uses; producers are not pressing for orders below current quotations; the quantity being consumed is about the same as the production. The stove foundries that have been idle since January 1 will remain silent until some agreement on wages between proprietors and molders. Quotations for the past week:

1 Hanging Rock Charcoal Foundry	\$22.00 @ \$22.25	
Tennessee and Alabama Charcoal	19.50 @ 20.00	
No. 2, 50¢ @ \$1 less		
Best No. 1 Hanging Rock Coke	30.00 @ 30.50	
Good	19.00 @ 19.50	
Tennessee, Alabama and Virginia	18.00 @ 19.00	
No. 2, 50¢ @ \$1 less		
Hanging Rock American Scotch	30.00 @ 19.75	
No. 2, \$1 less		
Best Hanging Rock Silver Gray		
Softener and Fluxer	19.75 @ 19.75	
No. 2	18.75 @ 18.75	
No. 3	18.25 @ 18.25	
Forge, \$16 @ \$22 for range of Stone-coal, Coke and Charcoal makes		
Car-Wheel, Warm-blast Charcoal	24.00 @ 27.00	
Cold-blast Charcoal, Tennessee	25.00 @ 26.00	
Virginia	28.50 @ 30.00	
Hanging Rock	28.50 @ 30.00	
Scrap Iron, Basis	22.50 @ 23.50	
Wheels	30.00 @ 31.00	
Wrought, 70¢ @ \$1 per 100 lb.		
Corrugated, 40¢ @ 70¢		

The rolling mills and foundries in this region, except some of the largest stove works, are all in full operation and reported as mostly on current orders. Criticisms of a late article in the Louisville Courier-Journal, referring to a contract for the delivery of a fabulous quantity of Pig Iron through 15 years, at \$12.50 per ton, are not creditable to that journal's integrity. There is such a contract in existence, but the conditions in it are known and held back by that journal, possibly for the reason that, if published, the article would be without force as a partisan argument.

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of April 14, 1884: There is some little improvement noticeable in trade circles during the past week, though still far short of what it should be for this season of the year. Values remain close and shaded as an incentive for business.

Ref. Bar Iron, 1 to 6 x 6 to 1. 10 @ 10 @ 2		
" 1 to 4 x 1 1/2 to 1. 10 @ 10 @ 2		
" 3/4 to 1, Round		
and Square		
Hoop Iron, 1 1/2 wide and upward	28 @ 28-10¢	
Band Iron, from 1 1/2 to 6 in. wide	31 @ 32-10¢	
Norway Nail Rods	5 @ 5 1/2¢	
Black Diamond Cast Steel	10 @ 11	
Machinery Steel	4 1/2 @ 5	
Spring Steel	4 @ 4 1/2¢	
Common Horse Nails	10 @ 11	
Railroad Spikes, 5/8 x 9-16	2 1/2 @ 2-6-10¢	
Perkins Horse Shoes, 3/4 keg of 100 lb.	\$3.87 1/2	
Nail Shoes	4 @ 4 1/2¢	

R. C. HOFFMAN & Co., Pig and Railroad Iron Merchants, No. 21 South Frederick street, write as follows, under date of April

14, 1884: The Iron market shows no material change. The demand is fully up to the supply, with light stocks on hand, especially of best brands Car-wheel Iron. Prices continue low, and we quote about as follows:

Baltimore Charcoal Wheel Iron (all)	\$28.00 @ 29.00	
Charcoal	28.00 @ 29.00	
Virginia C. B. Wheel Iron	28.00 @ 29.00	
Anthracite, No. 1	22.00 @ 23.00	
" No. 2	20.00 @ 21.00	
" No. 3	17.00 @ 18.00	
Charcoal C. B. Blooms	50.00 @ 55.00	
Refined Blooms	40.00 @ 45.00	

LOUISVILLE.

GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of April 12, 1884: The market continues quiet and without change in price. Consumers continue to buy what they need for their immediate wants. Very few future delivery contracts are being made. We quote, for cash in round lots, as below:

Southern Coke, No. 1, Foundry	\$18.50 @ \$19.50	
" No. 2	17.50 @ 18.25	
Hanging Rock Coke, No. 1, Foundry	19.50 @ 20.50	
" No. 2	18.50 @ 19.50	
Foundry	22.00 @ 23.50	
Southern Charcoal, No. 1, Foundry	21.00 @ 22.00	
Silver Gray, different grades	16.00 @ 18.00	
Southern Coke, No. 1 Mill, Neutral	16.00 @ 17.00	
" No. 2	15.50 @ 16.00	
" No. 1 Cold-sh't	15.50 @ 16.50	
Southern Charcoal, No. 1 Mill	16.00 @ 18.00	
White and Mottled, different grades	14.50 @ 15.00	
Southern Car-Wheel, standard brands	26.00 @ 27.00	
Southern Car-Wheel, other brands	22.00 @ 24.00	
Hanging Rock, Cold-blast	27.00 @ 28.00	
Warm-blast	22.00 @ 23.50	

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, Louisville, under date of April 12, report as follows: It is positively discouraging to write about Bar Iron. There are no signs of improvement in demand or price. Building operations on a fair scale seem to be projected everywhere, but the cold, wet weather has seriously retarded all work, and the railroads are limiting their purchases to pressing requirements. Nothing short of threatened scarcity, and that would be brought about only by artificial means, such as a general stoppage, would induce buyers to take hold freely. General assortments can be bought lower in a regular way at the present time than they could before the boom. There were then odd stocks of bankrupt mills, and others about to become so that were sold as odd, even as low as 1.5¢ rates, but these were not assorted Merchant specifications. **Hoops.**—There has been a little spurt in coopeage, and sales for the past two weeks were larger than at any other time this winter. **Sheet.**—Is unchanged. The inquiry for light gauges, May and June deliveries, still continues good. **Nails.**—The report of the establishment of a pool to embrace all the Western mills, while very interesting, does not gain complete credence as several of the mills have lately emphatically declared they would enter into no such combination; that the time had gone by for temporizing measures, and that the best mills must take their rightful places, as the blast furnaces are doing. **Wire.**—Is still very scarce and in strong demand. The advance is easily obtained and nobody grumbles at it.

ST. LOUIS.

HOFFER & Co., Pig Iron and Iron Ore Merchants, 318 Olive street, report to us as follows, under date of April 12, 1884: The market continues dull. We have marked prices on some brands lower. We quote:

NOT BLAST CHARCOAL IRONS.		
Missouri	\$19.00 @ 20.00	
Southern	20.00 @ 22.00	
Ohio	24.00 @ 25.00	
COAL AND COKE IRONS.		
Missouri	18.00 @ 20.00	
Southern	18.50 @ 20.50	
Ohio	21.00 @ 23.00	
MIL IRONS.		
Red-short	17.50 @ 18.50	
Neutral	17.00 @ 18.00	
CAR WHEEL AND MALLEABLE IRONS.		
Missouri	19.50 @ 21.00	
Southern	25.00 @ 28.00	
Ohio	25.00 @ 32.00	

EVERETT & POST, 421 North Third street, St. Louis, report to us as follows, under date of April 12, 1884: **Pig Lead.**—We have to report a lower market, but an active demand at the decline. The business for the past week aggregates 2500 tons of Common and Refined, for present and future delivery, at 3.9¢ down to 3.8¢, the latter figures representing values to-day, though some holders decline to meet these figures. **Spelter.**—Active demand from all consumers, and market strong at 4½¢.

METALS.

Copper.—Since our last week's report the market has remained listless, sales being confined to some 200,000 lb Lake Superior at 14½¢ @ 14¾¢, other brands simultaneously selling at 13¾¢ @ 14½¢. The market has in nowise been adversely influenced by the Calumet and Hecla passing its May dividend, which has been done for prudential reasons, because the company did not wish to make a loan. Being engaged in largely increasing its capacity, and having locked up a great deal of money in Copper not available till summer, the Calumet and Hecla deemed it wiser to disappoint its shareholders for once, everybody being aware that, even at the price the company sold on future delivery to the Europeans, its product leaves a very handsome profit. London has been looking up, and came yesterday, Chili Bars, £56, and Best Selected, £62. We are cabled thence to-day to the following effect: "There is a better feeling in market. Best Selected, £61. 10/ @ £62. 10/; Chili Bars, £56 @ £56. 10/." Manufacturers may be quoted as under: Bottoms, 24¢; Braziers, 24¢; Sheet, 22¢, and Bolt Copper, 24¢.

Tin.—The London market had improved to £84 the last few days, but was off again this morning to £83. 15/, while Singapore is £85, cost and freight to New York per steamer. Our own market settled down to-day to 18½¢, Straits, large lines, and 18¼¢ @ 18½¢ jobbing lots, at which it closes dull. No new features of interest have arisen; the market is for the moment exclusively the football of speculators, and elicits but little interest at the hands of consumers,

who confine their purchases to the strictly indispensable. We receive from London this afternoon the ensuing cablegram: "Market a little steadier. Straits, Ingot, spot, £84 @ £84. 15/; futures, £85 @ £85. 10/."

Tin Plates.—A very good jobbing demand has been developed during the week; the market is fairly strong at the following quotations for large lots, ordinary brands, per box: Charcoal Bright, \$5.40 @ \$5.75; ditto Ternes, \$5 @ \$5.75; Coke Tin, \$4.85 @ \$4.95, and ditto Ternes, \$4.75. Liverpool is also strong; there are no sellers there, the cable informs us, under 15/3, Cokes, and 18/ @ 20/, Charcoal. From London we are told that Tin Plates are unchanged.

Lead.—Our market has been about as dull as can be during the week; 100 tons Common Domestic sold at \$3.90, and subsequently a like quantity at 3¾¢, which is the closing figure, while Refined is nominally worth 4¢. St. Louis quotes, nominally, 3¾¢. From London we are told over the wires that Lead is unchanged at £11. 5/ @ £11. 15/ for Common English Pig. Manufacturers are quoted as follows: Lead Pipe, 6¼¢; Sheet Lead, 7¼¢; Tin-lined Lead Pipe, 15¢, and Block-Tin Pipe, 45¢, less the discount to dealers.

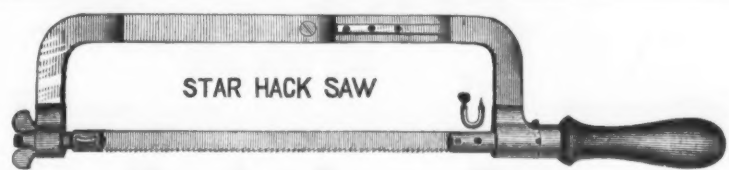
Spelter and Zinc.—Nothing of special interest has occurred during the week; whatever orders have to be filled cannot be executed under 4½¢ for Common Domestic, while Silesian is worth 5¢. The outlook remains hopeful and strong, Spelter forming pretty much the exception in the Metal market, because it is exceptionally well situated on this side. We are in receipt of the ensuing cable dispatch from London: "Market steady. Ordinary, at shipping ports, £14. 10/ @ £14. 12/6." We quote Bertha Refined, 8¢. For Sheet Zinc in small lots over 7¢ is asked from store.

Antimony.—Has been moderately active at 10¼¢ for Hallett and 11¼¢ for Cookson.

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York for the week ending April 16, 1884.

Hardware.	Wagner W. F.
Alexandre F. & Sons.	Bundles, 332
Brackets, bbls., 25	Bars, 54
Amserick G. & Co.	Cases, 4
Machines, cs., 2	Pieces, 2
Baldwin Bros. & Co.	Order,
Machinery, case, 1	Bails, 172
Belcher Henry W.	Bands, 72
Anvil, 1	Forgings, 8
Files, case, 1	Spring steel, bbls., 7
Bloomfield J. C.	Wire rods, bbls., 850
Machinery, case, 1	Railway bars, 82
Boker Hermann & Co.	Bundles, 120
Hdw., cutlery and	Rails for Canada, 672
guns, pkgs., 12	
Clark Mfg. End Co.	Iron.
Machinery, pkgs., 1	Baring Bros. & Co.
Codd Hiram & Co.	Fence rods, bbls., 33
Machinery, cs., 2	Bruno, Silva & Co.
Crittenden H.	Ors, tons, 280
Arms, case, 1	Crocker Bros.
Commandant Navy Y'd.	Pig, tons, 300
Boiler 1	Spiegel, tons, 322
Machinery, case, 1	Ferro, pkgs., 90
Dieckhoff, Raffaele &	Ferro, bxs., 41
Co.	Wire, bbls., 105 1/2
Cases 2	Ferro, cks., 75
Downing R. F. & Co.	Drexel, Morgan & Co.
Case, 1	Rivet rods, coils, 663
Drexel, Morgan & Co.	Hammacher A. & Co.
Cases, 20	Wire, cks., 5
Eggers & Heinlein,	Hernsheim L.
Cases, 3	Rods, bbls., 296
Field Alfred & Co.	Johnson John A. & Co.
Guns, cs., 5	Wire rods, pkgs., 1849
Case, 1	Morgan W. D. & Co.
Mdse., cs., 9	Galv. iron, cs., 6
Chains, cks., 10	Naylor & Co.
Graef Cutlery Co.	Rods, bbls., 1750
Cutlery, cs., 4	Bars, 711
Gt. West. Disp. Co.	Rugers T. W. & Co.
Arms, cs., 7	Old iron frame, 1
Hartley & Graham,	Shattuck & Binger.
Guns, cs., 2	Pieces, bags, 100
Hammacher H. & Co.	Shattuck G. W. & Co.
Case, 1	Pig, tons, 400
Lefferts Marshall,	Williamson Jas. & Co.
Machinery, case, 1	Pig, tons, 380
Plate casting, 1	Order,
Le Bottillier & Co.	Pig, lot
Case, 1	Spigel, lot
Levi Bros.	Wire rods, bbls., 2254
Cases, 2	Spiegel, tons, 630
Lindermoin O. & Co.	Rings, bbls., 34
Cases, 7	Old rails, tons, 20
Liquere R. S. & Co.	Rivet wire rods, coils,
Case, 1	659
Loewi Egar,	Rivet rods, coils, 440
Cases, 8	Swedish charcoal,
Moss F. W.	bbls., 308
Files, case, 1	Swedish rivet rods,
Moscowitz C. M. & Bros.	cks., 116
Case, 1	Swedish rivet wire
Murphy Alex. & Co.	rods, coils, 3091
Machinery, cs., 7	Bundles, 280
Oestler W. E.	Rods, bbls., 979
Swiss mach'y, cs., 4	Bars, 258
Parker H. C.	Sheet, case, 1
Pkgs., 2075	Old wr't tubes, lot
Schoverling, Daly &	Metals.
Gales,	Aikman Jas. & Co.
Arms, cs., 10	Tin plates, bxs., 580
Schulz E. L. C.	Ansonia Clock Co.
Machinery, cs., 4	Mdse., cs., 11
Sellers W. B.	Bank of Montreal.
Shattuck & Binger,	Tin and terne plates,
Box, 1	bxs., 3708
Sussfeld, Lorsch & Co.	Baring Bros. & Co.
Cases, 4	Tin plates, bxs., 1067
Wiesbaden, Hilger & Co.	Bond, Parsons & Co.
Hdw. and cutlery y,	Bond, Parsons & Co.
pkgs., 32	Carter, Hawley & Co.
Guns, pkgs., 46	Tin slabs, 319
Cases, 2	Dickerson, Van Dusen & Co.
Witte John G. & Co.	Tin and terne plates,
Cutlery, cs., 8	bxs., 745
Needles, case, 1	Tin plates, bxs., 550
Order,	Erie & Gt. West. Disp. Co.
Cutlery, cs., 2	Tin plates, bxs., 500
Case, 1	Heroy & Warrenner,
Anvils, pkgs., 175	Tinfol, cs., 7
Cog-wheels, 2	Ketcham E. & Co.
Machinery, cs., 14	Tin plates, cs., 889
Machines, cs., 1	Kriege & Co.
Razors, case, 1	Tin, case, 1
Machinery, pkgs., 1	Morgan W. D.
	Lead, pkgs., 414
Steel.	Naylor & Co.
Belcher Henry W.	Tin plates, bxs., 653
Bundles, 82	Tin sheets, cs., 19
Cases, 2	Phelps, Dodge & Co.
Codd Hiram & Co.	Black tag r's, bxx, 100
Brown Wm.	Tin p'ts., bxs., 30,822
Bundles, 154	Naylor & Co.
Cases, 15	Tin plates, bxs., 114
Joe Henry,	Noel Aug. & Co.
Pens, cs., 2	Tin leaves, cs., 10
vision, Blakeman & Co.	Phelps, Dodge & Co.
Pens, cs., 2	Tin plates, bxs., 25,408
Alance & Grosjean Mfg.	Black tag r's, bxx, 564
Co.	Antimony, cks., 25
Circles, bbls., 50	Scoville Mfg. Co.
Sheets, bbls., 50	Mdse., cs., 2
Storton, Kilas & Co.	Scribner's Sons Chas.
Bundles, 334	Stereo, plates, cs., 2
Cases, 8	Tiemann D. F. & Co.
Joss F. W.	Zinc oxide, bbls., 50
Bundles, 88	Order,
Bars, 5	Tin p'ts., bxs., 34,368
Naylor & Co.	Tin and terne plates,
Sheets, cs., 81	bxs., 2338
Billets, 2128	Tin slabs, 1216
Pieces, 457	Spelter dust, cks., 36
Temple & Lockwood,	Tin, p'gs, 128
Bars, 17	Lead, p'gs, 1660
Bars, 42	Antimony, cks., 27
Cases, 8	Lead, p'gs, 1660
	Tinned plates, cs., 25



Star Hack Saw Price List.

PRICE OF BLADES.

Length of Blade	6 inch.	7 inch.	8 inch.	9 inch.
Price per Dozen Blades	55	60	65	70 cents.

PRICE OF STEEL FRAMES PER DOZEN.

No. 1 Extension Frame, Polished and Nickel Plated, per Dozen	\$9.60
" 2 Solid	8.40

These frames are all made of steel, and, as seen in the cut, are all adjustable so as to face the blade in four different directions. The extension frames will hold the four different lengths of blades. The solid frames only hold the 8-inch blades, this being the length most in use; they all have the patent staple-shaped pins to hold the blades in the frame, which are so arranged that they cannot fall out. We say that the Star Hack Saw is 100 per cent. better than any other kind in use. If, on a fair trial, it is found that one dozen of our Saws will not cut as much as two dozen of any other kind, we hereby authorize all dealers to return what they may have in stock, at our expense. Now, if our competitors have the same faith in their saws, let them make the same offer, so that dealers may unload what they don't want, and sell only the best, whichever one it proves to be.

MILLERS FALLS CO.,

74 CHAMBERS ST., NEW YORK.

CHAMPLAIN

Forged Horse Nails.

MANUFACTURED BY THE

NATIONAL HORSE NAIL CO.,

Vergennes, Vermont.

HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.

WAREHOUSE

97 CHAMBERS AND 81 READE STREETS NEW YORK.

DURRIE & McCARTY, Sole Agents.

Bonney's New Hand Vise.



This is strictly a first-class article, embracing some new and desirable features. 1st. Both jaws open and close simultaneously, so that anything held therein is not only central, but on a line with the handle—a great advantage in filing, &c. 2d. It is hollow, allowing a rod to pass entirely through it, as shown in cut. A desirable feature, often saving much valuable stock.

BONNEY VISE & TOOL CO., Philadelphia, Pa., U. S. A.
H. B. SEIDEL. W. HASTINGS. E. T. CANBY.

SEIDEL, HASTINGS & CO.,

WILMINGTON, DELAWARE,

MANUFACTURERS OF

BEST CHARCOAL BOILER PLATES, AND PLATE IRON GENERALLY.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 53,508 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30 1/2 per centum. Our prices are as low as the production of a good article will admit of.



VARIETY IRON WORKS.

ALFRED C. REX & CO.,

MANUFACTURERS OF

Hardware Specialties,

IRON TOYS AND NOVELTIES.

Main Office and Factory, Frankford, Phila.

Phila. Sample Office, 415 Commerce St.

Send for Catalogue.

New York Branch Office, 125 Chambers St.

BRAMHALL & SPIER, Managers.

S. CHENEY & SON,

MANLIUS, N. Y.

MANUFACTURERS OF LIGHT AND MEDIUM WEIGHT

GRAY IRON CASTINGS.

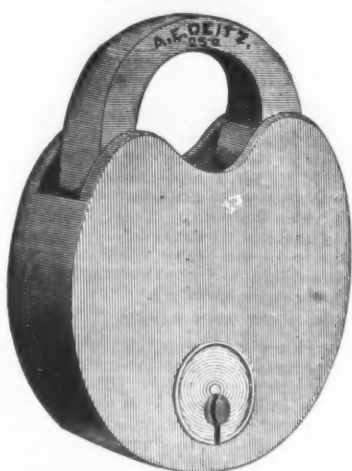
METAL PATTERN MAKERS AND JAPANNERS.

Correspondence solicited.

RIVETS

CLARK & COWLES, ALL KINDS OF RIVETS. Plainville, Conn.

A. E. DEITZ.



DURRIE & McCARTY, Agents,

97 Chambers & 81 Reade Sts., New York.



CAST BRASS HARDWARE

FOR ICE HOUSES AND REFRIGERATORS.

Manufactured and kept in stock by

W. & J. TIEBOUT,

Manufacturers of

BRASS, GALVANIZED & SHIP CHANDLERY HARDWARE,

Nos. 16 & 18 Chambers St., NEW YORK.

NEW YORK STANDARD SCALE CO.,



MANUFACTURERS OF EVERY DESCRIPTION OF

First-Class Weighing Machines.

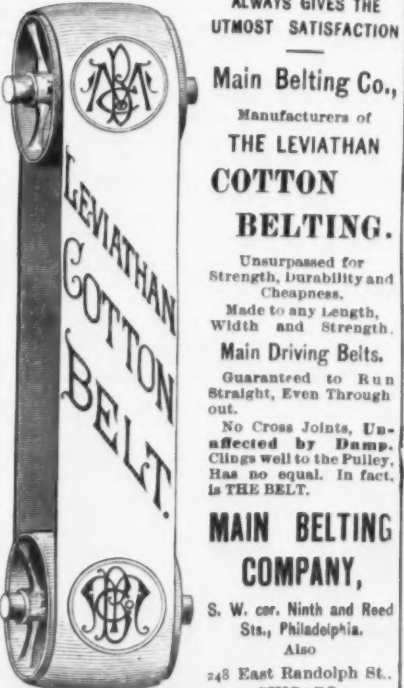
Our line of COUNTER SCALES for fine workmanship and accuracy is unequalled.

FACTORY: KINGSTON, N. Y.

OFFICE AND SALESROOM, 46 MURRAY ST. NEW YORK.

T. W. WILLIAMS, Agent.

Send for Descriptive Catalogue.



ALWAYS GIVES THE

UTMOST SATISFACTION

Main Belting Co.,

Manufacturers of

THE LEVIATHAN

COTTON

BELTING.

Unsurpassed for

Strength, Durability and

Cheapness.

Made to any Length,

Width and Strength.

Main Driving Belts.

Guaranteed to Run

Straight, Even Through

out.

No Cross Joints, Un-

affected by Damp.

Clings well to the Pulley.

Has no equal. In fact,

is THE BELT.

MAIN BELTING

COMPANY,

S. W. cor. Ninth and Reed

Sts., Philadelphia.

Also

248 East Randolph St.,

CHICAGO.

WOOD ENGRAVING
EXECUTED IN SUPERIOR STYLE
AND AT SHORTEST NOTICE BY
O. W. MADDAUS
23 PARK ROW, N.Y.

L. COES' Genuine and Mechanics,

PATENT

Screw Wrenches

MANUFACTURED BY

L. COES & CO.,

Worcester, Mass.

ESTABLISHED IN 1839.



Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped

L. COES & CO.,

Worcester, Mass.

Warehouse,

97 Chambers and 81 Reade Sts.

NEW YORK.

DURRIE & McCARTY,

Sole Agents.

1884.

PENNSYLVANIA

LAWN MOWER.



Has no Equal, Sur-

passing all others,

and pronounced

"THE BEST."

For descriptive catalogue and prices write to

LLOYD & SUPPLEE HARDWARE CO., Phila-
delphia.
DURRIE & McCARTY, New York.
AMES PLOW CO., Boston, Mass.
PRATT & CO., Buffalo, N. Y.
SIMMONS HARDWARE CO., St. Louis, Mo.
HAMILTON & MATTHEWS Rochester, N. Y.
MARKLEY, ALLING & CO., Chicago, Ill.
HUNTINGTON, HOPKINS & CO., Sacramento
and San Francisco, Cal.
R. A. CULTER & CO., Peoria, Ill.
DUCHARNE, FLETCHER & CO., Detroit, Mich.
LOCKWOOD, TAYLOR & CO., Cleveland, Ohio.
WM. FRANKFURTH & CO., Milwaukee, Wis.

WALTER S. LUDLOW, Cincinnati, Ohio.
LLOYD & CLARKE, La Crosse, Wis.
H. MITCHELL & CO., Columbus, Ohio.
BURROUGHS BROS., Kansas City, Mo.
THE TODD-DONIHAN IRON CO., Louisville, Ky.
LAYMAN, CAREY & CO., Indianapolis, Ind.
A. E. BONESTEEL, Troy, N. Y.
FERRIN BROS., Lafayette, Ind.
KRUSE & BAHLMANN, Cincinnati, Ohio.
JANNEY, BROOKS & CO., Minneapolis, Minn.
LOGAN, GREGG & CO., Pittsburgh, Pa.
E. WHITMAN, SONS & CO., Baltimore, Md.
SHULTZ & HOSFA, St. Joseph, Mo.
OTT BROS. & CO., Wheeling, W. Va.

PURE TURKISH EMERY.

WALPOLE EMERY MILLS,

South Walpole, Mass.

NIMICK & BRITTAN MFG. CO.,

PITTSBURGH, PA.,

BUILDERS' FINE HARDWARE,

Embracing Door Locks, Latches, Knobs, Butts, Sash Locks, &c.

IMPROVED ROSE ESCUTCHEON KNOBS,

In GENUINE BRONZE or IMITATION BRONZE.

PADLOCKS.

TEA, COUNTER, UNION AND PLATFORM SCALES.

Catalogues and Lists furnished on application.

GRAHAM & HAINES, Agents, 113 Chambers St., New York.



SCYTHE SNATHS

AND

Grain Cradles.

In the "Peerless" Grass Snath we present a simple and successful device for adjusting the hang of a Scythe in, or out, from the smallest to the greatest degree. The Eye-Bolt having a Large Bearing Surface, grips the swinging plate and holds it firmly where placed. On advanced orders we can furnish the "Peerless" Snaths to fit either extra long or extra short Scythe Heels, a matter of importance when Scythe makers have no uniform standard length for their scythe heels.

THE IOWA FARMING TOOL CO.,
Makers of SNATHS, CRADLES, FORKS, HOES, RAKES, &c.,
FOR HOME AND EXPORT TRADE.

FORT MADISON IOWA, U. S. A.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending April 15, 1884.

Danish West Indies		Quan.	Val.
Cutlery, cs.	9	\$154	
Plum., gals.	2,250	251	
Nails, bxs.	3	12	
Nails, kegs.	6	22	
Hdw., pkgs.	19	100	
Mf. iron, pkgs.	14	82	
Dutch East Indies			
Plum., gals.	737,360	70,340	
Arms, cs.	3	50	
Stettin			
Plum., gals.	306,600	17,300	
Esbjerg (Denmark)			
Plum., gals.	51,645	4,644	
Hamburg			
Mach'y, pkgs.	22	3,525	
Plum., gals.	373,967	31,698	
Hdw., pkgs.	120	2,995	
Clocks, bxs.	144	2,666	
Nickel, mak. bbls.	73	851	
Cutlery, case.	1	75	
Ag. imp. pkgs.	522	11,045	
Sew. machs, cs.	1591	82,490	
Pumps, pkgs.	1	77	
Arms, case.	1	41	
Revolvers, cs.	9	53	
Wire, cs.	6	125	
Blowers, cs.	2	300	
Bremen			
Ag. imp. pkgs.	8	586	
Pig. press, cs.	15	500	
Hdw., cs.	23	453	
Mf. iron, pkgs.	38	390	
Sew. machs, cs.	237	4,200	
Rotterdam			
Ag. imp. pkgs.	15	380	
Clocks, pkgs.	9	311	
W. cloths, cs.	6	45	
Plum., gals.	359,649	22,938	
Hdw., pkgs.	44	1,121	
Revolvers, cs.	2	222	
Mch'y, pkgs.	2	149	
Pumps, pkgs.	22	1,337	
Amsterdam			
Pumps, pkgs.	9	405	
London			
Sew. machs, cs.	301	5,823	
Iron tanks, cs.	11	400	
Rifles, cs.	50	7,510	
Ox. sine, bbls.	125	1,086	
Hdw., pkgs.	90	2,312	
Guns, cs.	73	12,990	
Scabbards, cs.	2	600	
Saws, cs.	4	1,000	
Cartridges, cs.	10	271	
Ag. imp. pkgs.	981	17,410	
Per. caps, cs.	2	110	
Bayonets, cs.	10	180	
Clocks, cs.	119	3,625	
Liverpool			
Mach'y, pkgs.	14	3,383	
Gas tub, cs.	1	330	
Ag. imp. pkgs.	573	11,008	
Pumps, pkgs.	17	707	
Pistols, cs.	8	890	
Clocks, pkgs.	172	4,428	
Saws, cs.	4	729	
Guns, case.	1	111	
Rifles, case.	1	240	
Wh'ls & a, cs.	7	410	
Hdw., pkgs.	2	232	
Sew. machs, cs.	72	2,012	
Mf. iron, pkgs.	3	38	
Antwerp			
Hdw., pkgs.	25	475	
Ag. imp. pkgs.	8	115	
Copper, cs.	87	35,500	
Mch'y, pkgs.	3	1,600	
Hull			
Ag. imp. pkgs.	1152	26,590	
Sew. machs, cs.	87	15,016	
Clocks, pkgs.	19	1,242	
Wash. ma, cs.	2	80	
Hdw., pkgs.	77	1,521	
Mach'y, pkgs.	8	400	
Pumps, pkgs.	4	252	
Saws, cs.	9	521	
Glasgow			
Ag. imp. pkgs.	101	1,222	
D'f. springs, cs.	9	450	
Mach'y, pkgs.	15	1,170	
Hdw., cs.	21	476	
S. rollers, cs.	23	495	
Cutlery, case.	1	240	
British Guiana			
Hdw., cs.	2	98	
Air gun, cs.	2	30	
Mach'y, pkgs.	3	400	
Mf. iron, pkgs.	8	83	
Clocks, cs.	7	253	
British West Indies			
Nails, bxs.	24	130	
Clocks, pkgs.	4	53	
Saws, cs.	1	300	
Boiler, cs.	1	300	
Nails, kegs.	74	292	
Scales, cs.	11	119	
Plum., gals.	6231	725	
Chain, cs.	1	25	
Windlass, cs.	1	25	
Springs, bxs.	6	33	
Hdw., pkgs.	26	399	
Cop. gds, cs.	3	53	
Cartridges, cs.	1	15	
Mach'y, pkgs.	1	35	
Nova Scotia			
Mf. iron, pkgs.	58	677	
Clocks, pkgs.	16	251	
Hdw., pkgs.	9	362	
Newfoundland			
Hdw., cs.	8	353	
Mach'y, pkgs.	2	43	
Plum., gals.	302	30	
Mf. iron, pkgs.	1	35	
New Brunswick			
Plum., gals.	10,300	1,300	
Mach'y, pkgs.	33	2,000	
Canada			
Tin plates, bxs.	20	119	
British East Indies			
Plum., gals.	422,500	44,373	
Havre			
Iron, case.	1	32	
Ag. imp. pkgs.	235	3,279	
Hdw., cs.	2	210	
Platina, case.	1	1,000	
Pumps, pkgs.	6	401	
Mach'y, pkgs.	1	450	
Sew. machs, cs.	62	679	
Copper, csks.	35	15,700	
Bordeaux			
Ag. imp. pkgs.	141	3,325	
Pumps, pkgs.	31	1,588	
Marseilles			
C. matte, bags	5056	47,000	
Cuba			
Mf. iron, pkgs.	26	1,006	
Mach'y, pkgs.	70	2,380	
Plum., gals.	123,076	12,360	

COAL.

A total suspension of production for one week by the principal mining companies in the Anthracite Coal trade, as foreshadowed in these columns last Thursday, is now in full force. The movement is equivalent to taking out of the market from 650,000 to 750,000 tons. Further than this nothing definite is yet arranged, but a conference will take place immediately. Meanwhile trade is very slow, all hands waiting future developments—purchasers keeping aloof to take advantage of a possible more favorable turn. This is especially true in the East. One proposition is to cut the output for

April, May, June and July to 8,500,000 tons, and apportion the amount to the several interests. Last year the output in these four months was 10,237,202 tons, and it has averaged 9,043,377 tons the past four years.

The Bituminous trade is quiet, though several contracts for considerable amounts are said to have been closed. An instance is cited where Coal sold as low as \$3.10, f.o.b. at Amboy.

OLD METALS, PAPER STOCK, &C.

The purchasing prices offered by dealers are as follows:

Copper, heavy	10.10 @ .11
light	.10 @ .11
Copper Bottoms	.09 @ .10
Yellow Metal	.07 @ .08
Brass, heavy	.07 @ .08
light	.06 @ .07
Composition, heavy	.05 @ .06
Lead, heavy	.04 @ .05
Tea Lead	.03 @ .04
Zinc	.02 @ .03
Pewter, No. 1	.14 @ .15
No. 2	.10 @ .11
Wrought Iron	20.00 @ .21
Light	12.00 @ 13.00
Stove Plate Iron	10.00 @ 10.50
Machinery	14.50 @ 15.00
Grate Bars	4.50 @ .05
Stereotype Plates	.04 @ .05
Electrotype	.03 @ .04
Small Type	.02 @ .03

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	24 @ 4
White Cotton, No. 2	24 @ 24
No. 1	24 @ 24
No. 2	14 @ 2
Seconds	7 @ 1
Soft Woolens	5 @ 6
Mixed Rags	1 1/2 @ 1 3/4
Gunny Bagging	2 @ 2 1/2
Jute Butts	2 @ 2 1/2
Cotton Bagging	1 1/2 @ 3 1/2
Book Stock	1 1/2 @ 2
Newspapers	1 @ .5
Waste Paper and Scraps	1 @ .5
Kentucky Bale Rope	3 1/2 @ 4

FOREIGN TRADE MOVEMENTS.

The following shows the imports of hardware and metals at this port for the week ending April 11:

Anvils	163	1,108
Antimony	37	2,325
Bismuth	7	3,613
Brass goods	5	45
Bronzes	19	2,070
Chains and anchors	22	866
Clocks	39	4,616
Copper	110	756
Cutlery	10	30,359
Gas fixtures	5	3,013
Guns	128	18,910
Hardware	10	609
Iron, pig, tons	1,160	14,794
Iron, sheet, tons	46	3,417
Iron ore, tons	325	7,221
Iron, other, tons	282	10,131
Machinery	29	4,696
Metal goods	654	39,623
Nails	54	926
Needles	17	7,755
Old metal	11	1,114
Pins	31	3,135
Platina	5	11,485
Plumbago	10	1,796
Quicksilver	233	6,782
Saddlery	15	2,392
Silverware	9	949
Stelver	10,280	32,747
Steel	35,134	32,747
Tin, boxes	38,933	188,793
Tin, 4 1/2 lbs.	271,953	46,611
Wire	1,417	10,881
Zinc oxide	39,655	1,615

The following is a comparison with previous dates:

	For the 14 weeks	Same
	week of 1883	time 1883
Cutlery, pkgs.	110	1,531
Hardware, pkgs.	10	241
Iron, R. R., bars	9	9,230
Lead, pkgs.	35	10,374
Steel, pkgs.	35,134	277,370
Tin, bxs.	38,933	465,730
Tin slabs, lbs.	271,953	5,230,970

Our English Letter.

(From Our Regular Correspondent.)

LONDON, ENG., March 31, 1884.

THE SITUATION

has not undergone any material changes since my last, the only variation of any note having been an upward movement in tin, of which cable advices render it quite superfluous to speak at length in this correspondence. Almost all the speculative media in the produce, metal, corn, &c., markets are in a most lethargic condition, and the so-called "standard" values are all much lower than ever before known. Old hands are completely out of their reckoning under such conditions, and are operating with great caution, lest they should be caught and cornered by some sudden change of which there are at present no signs. The bears declare their utter ignorance of the causes which may have led to the diminution of standard values, but they appreciate effects and declare that they never felt safer than just now. In metals bearing has its lower limits, however, and there are points below which prices cannot go without bringing about a most serious state of affairs. Whether these limits have or have not been passed in several instances is not yet apparent to outsiders, but in certain quarters a severe "nip" is believed to be in progress, and it would cause no surprise to learn that two or three firms had succumbed. Losses which occur now and then in the market may very well be borne and made good, but month after month of depression, with scarcely more than £1 or £2 margins, are trying, and charges for storage, interest, &c., go on just the same as when fluctuations are of the most violent character. It is to be hoped that no stoppages of importance will take place, yet it would be foolish to close one's eyes to current events or to ignore what is going on in our midst. In India-rubber the corner which has been so assiduously "compiled" and exploited by a large firm at Havre has "bust" events having proved too strong for the speculators, who have suspended payment. The event should not be without its lessons in other directions, especially as a hint to manipulators of leading goods that immense resources, great tact, unrivaled knowledge of the market, would divide connections, and unblinking "push" are prime requisites of success. Failing any of these, the cornerers are pretty certain to fail and become "a by-word and a mockery."

THE IRON AND STEEL INSTITUTE

spring meeting will be held in London a fortnight earlier than usual, namely, on

April 23, 24 and 25. The papers to be presented will be interesting, and it is just possible that the gathering may be signalized by a conversation at the South Kensington Museum, in the same way as the similar affairs of the Institute of Civil, &c., Engineers. According to some of the papers, the autumn meeting has been fixed to take place at Sheffield in September; but the *Ironmonger* appears to regard the question as being still an open one, and makes a strong bid for the acceptance of the courteous invitation which has been received from the American Institute of Mining Engineers. There is no doubt whatever in my own mind that a trip to the States would be a very popular venture, and would attract a large attendance of the members.

THE IRON MARKET

is quiet, with a fairly good turnover in the commoner sorts on export account, but with much irregularity in prices. The opening out of the shipping season is causing some enlargement of the shipments of crude iron, and may shortly lead to similar changes in other directions, but while the home market remains in its present dull condition trade cannot well revive. As regards the external markets, current advices may be deemed about an average. On the Continent matters appear to be a little better, and the American market is beginning to move, but from our Colonies and the larger non-producing markets cable and mail advices are not of a nature leading to the expectation of a greatly augmented demand. India is buying fairly well, but its consuming capacities are pretty well ascertained, and will not be enlarged unless the proposed railway extensions are carried out on a large scale. At Glasgow the iron market has ruled quiet on the week, and warrants, after fluctuations of minor importance, closed at 42/6 1/2 ton. The reduced output is being continued, yet Connal's stocks are still increasing, and the comparison of the shipments is unfavorable to the present year. The decrease is wholly foreign-wise, the coastwise shipments having increased by nearly 2000 tons, while to foreign ports the decrease has been about 12,700 tons. The controversy on the "G. M. B." question is being continued in a desultory manner as to the quantity of cinder and its composition used in the production of the "Govan" pig iron of William Dixon, Limited. The Middlesbrough market has been steady, mainly because of a considerable improvement in the shipments, but also on account of the reduced make, which is being accompanied by a decrease in the stocks. It is hoped and expected that the statistical position at the end of the month will be found to have greatly improved, even in the face of the decreased local consumption. For No. 3 quotations range from 37/3 to 37/6. On the West Coast there has been no quotable alteration in hematite pig iron, mixed lots of which are quoted at 47/ @ 47/6 1/2 ton, in usual proportions. The shipments are good, but rail deliveries are not in all cases up to the average. Elsewhere I have scarcely any variations to note in crude iron, of which open sales are on a comparatively limited scale, albeit deliveries on running contracts are fairly good. The total make, however, is in excess of the consumptive requirements of the market; consequently, stocks are growing rather bulky in some quarters. Heavy manufactured iron is dull, especially as regards shipbuilding sorts, the production of which in the North of England is being greatly lessened. At many of the works specially laid out for ship-plates, angles, &c., much of the plant is being laid off for want of work. For boiler-plates and structural ironwork, however, there is still a respectable demand, and the chain, cable and anchor manufacturers are tolerably well employed. In respect of ordinary finished iron, there is scarcely any news worthy of record. Marked bars remain at 27/ 10/ and are neglected, the bulk of the business on hand being in respect of common and medium sorts, at prices between 25/ 10/ and 26/ 10/ 1/2 ton. Sheets are steady, on the strength of the restriction arrangement, but there scarcely seems sufficient vitality in the demand at present to force up values to any material extent. Some makers, nevertheless, are asking 2/6 @ 5/ 1/2 ton more. In hoops and strips the movement is light. Galvanized iron and fencing wire are very dull, and orders are scarce even at the low rates now put forward. Iron rails, old rails (at 60/ @ 62/6, f.o.b. for D. H., with small stocks) and heavy wrought scrap (at 45/ @ 50/ f.o.b. London, for selected lots) are quiet in all directions. Crop ends are in good request at 51/ @ 52/6, f.o.b. Wales, &c. Freighters are firmer, but without other than minor changes. Pig iron, by ordinary steamers from Glasgow to New York, is about 6/ 1/2 ton, while sailing rates from Glasgow include Demerara, 3/; Montreal, 12/6; New Orleans, 15/; New York, 7/6; Philadelphia, 10/; Portland, 13/; Providence, 12/6; Rio de Janeiro, 20/; and San Francisco, 20/.

The rates from Liverpool are as last quoted, but it is announced that on and after April 1 tin plates to New York will be advanced to 7/6 1/2 ton. Steel is without change to note in point of the demand, but some changes in values in a downward direction are reported. The great majority of the crucible-steel houses at Sheffield are only moderately engaged, the exceptions being firms producing special brands, large forgings or castings and articles for particular purposes. The Bessemer concerns are fairly occupied on rolled sorts. For steel-wire rods large American orders have been well placed, but it is understood that the work will be done in Germany. The total is said to be about 20,000 tons. Prices have not transpired. The Siemens concerns continue steadily engaged. Steel rails are sustained in prices at about 24/ 17/6 for ordinary sections and weights, which are in slow request, although several inquiries are being circulated. Light sorts for tramway, &c., purposes are firm at the recent advance in values.

BESSEMER AND MUSKET.

The publication of Mr. W. T. Jeans' (not Mr. J. S. Jeans, the better-known Secretary of the Iron and Steel Institute) book, entitled "Creators of the Age of Steel," has once more brought up Mr. Mushet and his claims. Mr. Jeans did not give Mr. Mushet credit for what he did in the way of using

metallic manganese in the production of pneumatic steel, and claimed all the credit of the discovery for Mr. (now Sir) Henry Bessemer. This has greatly grieved Mr. Mushet, who has rarely missed a chance of airing his "grievances" in public, or of giving Sir Henry Bessemer sly or open kicks. The technical papers here are full of Mr. Mushet's outpourings and Mr. Jeans' brief rejoinders, although nobody can be reasonably expected to take a lively interest in a controversy which was really threshed out and buried many years ago. That the pneumatic process did owe something to Mushet nobody denies, but that Mushet has any valid claim to be regarded as the inventor of pneumatic steel is incapable of proof. As a personal matter between Sir Henry Bessemer and Mr. Mushet, the dispute (which is wholly on the part of the latter) cannot well be explained here; but I may perhaps be permitted to express my opinion that Mr. Mushet is guilty of very bad taste—and perhaps something worse even than that—in thus throwing himself at Sir Henry Bessemer, who has treated Mr. Mushet very handsomely. I know whereof I write on this subject, and I would strongly recommend to Mr. Mushet the virtues of silence and gratitude. Should that gentleman peruse this paragraph, he will know exactly what I mean.

SCOTCH PIG IRON

is very quiet indeed, scarcely any movement either in warrants or in special brands having taken place during the past week. Margins on warrants for the entire period have not exceeded 1/ 1/2 ton, and there appears to be no disposition on the part of the public to purchase. All things considered, there appears to be little or no prospect of an immediate improvement. There are 93 furnaces at work in Scotland, as compared with 111 a year ago, when warrants were 47/5, against 42/5 now. In Connal's stores, at Glasgow, the stocks amount to 594,490 tons (an increase for the week of 115 tons), as compared with 585,059 tons this date last year. Shipments to date are 17,312 tons, a decrease of 12,089 tons so far in 1884. Middlesbrough pig-iron imports into Scotland have been 66,400 tons, an increase of 10,169 tons in 1883. Included in last week's shipments from the Clyde were 1820 tons pig iron for the United States, and 794 tons to Australia. Writing from Glasgow, on March 29, James Watson & Co. said:

"The Scotch iron market continues in a most inanimate state, with a great absence of fresh business, yet prices remain remarkably steady. Shipments are well maintained for the season of the year. The warrant market was steady on Monday, with transactions from 42/5 1/2 to 42/6 1/2 1/2 ton. On Tuesday it was firmer and the price advanced to 42/7 1/2, closing weak at 42/5 1/2 ton. On Wednesday a small business was done between 42/4 1/2 and 42/5 1/2, cash, and yesterday the market was unaltered at 42/5 @ 42/5 1/2, cash. To-day it was lifeless, with a very small business done between 42/5 and 42/6, closing with sellers at 42/5 1/2, buyers offering 42/5 1/2 ton. The shipments last week were 11,577 tons, as compared with 12,421 tons for the corresponding week of last year."

We quote:

	No. 1.	No. 3.
M. B., at Glasgow	41/	41/6
Clyde	45/	45/6
Coltness	52/6	51/
Langhorne	54/6	51/
Garthshore	53/	51/
Summerlee	52/	48/
Caldar	53/6	47/6
Langbroke	53/	48/
Langbarnock, at Ardrossan	52/	46/
Glinton	46/	46/
Almington	48/	46/
Notes, at Leith	52/0	32/
Innell, at Bo'ness	46/	47/
Arron, at Grangemouth	48/6	47/6

WHOLESALE METAL PRICES, April 16, 1884.

(For Wholesale Hardware Prices. See Pages 32, 33.)

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no Bar Iron shall pay a less rate of duty than 85¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scroll, 1¢ to 1-4-10¢ per lb. Railroad Bars weighing more than 25 lb per yard, 7-10¢ of 1¢ per lb.

American Iron.	
Foundry No. 1.	ton 20.00 @ 21.00
Foundry No. 2.	ton 18.50 @ 19.50
Gray Forge.	ton 17.50 @ 18.50
Scotch Iron.	
Carnbroe.	ton 22.00 @ 23.00
Coltess.	ton 23.00 @ 24.00
Shotts.	ton 22.00 @ 23.00
Glenarnock.	ton 22.00 @ 23.00
Glasgow.	ton 22.00 @ 23.00
Langloan.	ton 22.00 @ 23.00
Summerlee.	ton 21.75 @ 22.75
Dalmington.	ton 20.75 @ 21.75
Eglinton.	ton 20.25 @ 21.25
Clyde.	ton 20.50 @ 21.50

Rails.	
Steel, at Eastern mills.	ton 33.00 @ 34.00
Old Rails, Ts.	ton 19.00 @ 20.00
Wrought, per ton, from yard.	22.00 @ 23.00

Bar Iron from Store.	
Common Iron.	ton 20.00 @ 21.00
1 to 1 in. round and square.	ton 20.00 @ 21.00
1 to 6 in. x 3/4 to 1 in.	ton 20.00 @ 21.00
Refined Iron.	ton 21.00 @ 22.00
1 to 2 in. round and square.	ton 21.00 @ 22.00
1 to 6 in. x 3/4 to 1 in.	ton 21.00 @ 22.00
Rods—1/2 and 1-1/2 round and sq.	ton 22.00 @ 23.00
Bands—1 to 6 in. round and sq.	ton 22.00 @ 23.00
"Burden's Best" Iron, base price.	ton 21.00 @ 22.00
Burden's "H. B. & S." Iron, base price.	ton 21.00 @ 22.00
Norway Nail Rods.	ton 21.00 @ 22.00

Sheet Iron.	
Common.	ton 20.00 @ 21.00
American.	ton 21.00 @ 22.00
R. G.	ton 22.00 @ 23.00
Nos. 10 to 16.	ton 23.00 @ 24.00
17 to 24.	ton 24.00 @ 25.00
25 to 30.	ton 25.00 @ 26.00
31 to 36.	ton 26.00 @ 27.00
37 to 42.	ton 27.00 @ 28.00
43 to 48.	ton 28.00 @ 29.00
49 to 54.	ton 29.00 @ 30.00
55 to 60.	ton 30.00 @ 31.00
61 to 66.	ton 31.00 @ 32.00
67 to 72.	ton 32.00 @ 33.00
73 to 78.	ton 33.00 @ 34.00
79 to 84.	ton 34.00 @ 35.00
85 to 90.	ton 35.00 @ 36.00
91 to 96.	ton 36.00 @ 37.00
97 to 102.	ton 37.00 @ 38.00
103 to 108.	ton 38.00 @ 39.00
109 to 114.	ton 39.00 @ 40.00
115 to 120.	ton 40.00 @ 41.00
American Cold Rolled B. B.	ton 41.00 @ 42.00

IRON WIRE.—See Wire. Valued at 4¢ per lb. or less, 45¢ ad val.; valued above 4¢ and not above 7¢ per lb., 45¢ ad val.; valued above 7¢ and not above 10¢ per lb., 45¢ ad val.; valued above 10¢ per lb., 45¢ ad val. Extra—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¢ per lb. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

American Cast Steel. For American Steel, see Pittsburgh quotations.

English Steel.	
Best Cast.	ton 15.00 @ 16.00
Extra Cast.	ton 16.00 @ 17.00
Circular Saw Plates.	ton 17.00 @ 18.00
Round Machinery Cast.	ton 18.00 @ 19.00
Swaged Cast.	ton 19.00 @ 20.00
Best Double Shear.	ton 20.00 @ 21.00
Blister, 1st quality.	ton 21.00 @ 22.00
German Steel, Best.	ton 22.00 @ 23.00
2d quality.	ton 23.00 @ 24.00
3d quality.	ton 24.00 @ 25.00
Sheet Cast Steel, 1st quality.	ton 25.00 @ 26.00
2d quality.	ton 26.00 @ 27.00
3d quality.	ton 27.00 @ 28.00
TIN. —Duty: Pig, Sheet, Tag and Term.	
1¢ per lb.; Bars, Block and Pig free.	
Banco.	ton 20.00 @ 21.00
Straits.	ton 21.00 @ 22.00
English.	ton 22.00 @ 23.00
Bar.	ton 23.00 @ 24.00

Charcoal Tin Plates.	
I C 10x14.	25 sheets. \$5.75 @ \$6.50
I C 12x12.	25 sheets. 12.00 @ 13.00
I C 14x10.	25 sheets. 7.25 @ 8.00
I C 12x12.	25 sheets. 7.25 @ 8.00
I C 14x10.	25 sheets. 7.25 @ 8.00
D C 12x12.	100 sheets. 5.50 @ 5.75
D C 14x10.	100 sheets. 5.50 @ 5.75
For each additional X add.	1.50

Coke Tin Plates.	
I C 10x14.	25 sheets. \$5.50 @ \$5.75
I C 12x12.	25 sheets. 5.25 @ 5.50
I C 14x10.	25 sheets. 5.25 @ 5.50
I C 12x12.	25 sheets. 5.25 @ 5.50
I C 14x10.	25 sheets. 5.25 @ 5.50
D C 12x12.	100 sheets. 5.00 @ 5.25
D C 14x10.	100 sheets. 5.00 @ 5.25
For each additional X add.	1.50

Terne Plates.	
I C 14x20 M. F.	21 quality. 10.00 @ 11.00
I C 14x20.	25 sheets. 5.50 @ 5.75
I C 14x20.	6.50 @ 6.75
I C 20x28.	10.75 @ 11.00
I C 20x28.	13.50 @ 14.00
I C 20x28.	13.50 @ 14.00

Tin Boiler Plates.	
IXX 14x36, 2 sheets for No. 7, 112 sheets.	@ \$13.50
IXX 14x36, 2 sheets for No. 8, 144 sheets.	@ 14.50
IXX 14x36, 2 sheets for No. 9, 168 sheets.	@ 16.00

COPPER.—Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingot, Lake.	ton 15.00 @ 16.00
Ingot, Baltimore.	ton 14.00 @ 15.00
Braziers' Copper, ordinary sizes, 16 oz. per sq. ft. and over.	ton 23.00 @ 24.00
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. per sq. ft.	ton 25.00 @ 26.00
Braziers' Copper, 10 oz. and 12 oz. per sq. ft.	ton 28.00 @ 29.00
Lighter than 10 oz. per sq. ft.	ton 30.00 @ 31.00
Circles less than 14 in. diam.	ton 32.00 @ 33.00
84 in. diam. and over.	ton 34.00 @ 35.00
Segment and Pattern Sheets.	ton 36.00 @ 37.00
Locomotive Fire-Box Sheets.	ton 38.00 @ 39.00
Sheathing Copper, over 12 oz. per sq. ft.	ton 40.00 @ 41.00
Boiler Copper.	ton 42.00 @ 43.00
Copper Bottoms, 14x18.	ton 44.00 @ 45.00
Tinned Sheathing, 14x18, 14, 16.	ton 46.00 @ 47.00
Tinned Sheathing, Planished for boilers, 7, 8, 9 oz.	ton 48.00 @ 49.00
Nickel-Plated Sheathing.	ton 50.00 @ 51.00
Plating extra.	ton 52.00 @ 53.00
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes.	ton 54.00 @ 55.00

Tinning. 14x18, by the case. 14x18, less than case. 14x18, For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net. 12 and 16 oz. and heavier. 35¢ By the case. 14x18, 12 oz. and lighter. 30¢

Boiler Sizes. 7 in., 14x20. 8 in., 14x20. 9 in., 14x20. 14 and 16 oz. and heavier. 37¢ By the case. 14x18, (And all sizes not over 20 in. wide.) 14 and 16 oz. and heavier. 30¢

Copper Wire.—(See Wire.) Yellow Sheathing Metal, 1/2 lb. 20¢ Brass and German Silver.

BRASS AND GERMAN SILVER. Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

LEAD.—Duty: Pig, 3¢ per 100 lb.; Old Lead, 2¢ per 100 lb.; Pipe and Sheet, 3¢ per lb.

NICKEL. Metallic, in grains. 100 lb. 85¢ Metallic, in grains, 100 lb. 85¢ Metallic Anodes. \$1.35 @ 1.40

Nickel-Plating Materials. Composition, Cutting. 100 lb. \$0.07 Composition, Cutting. 100 lb. \$0.07 Composition, Emery Cake. 100 lb. \$0.07

ANTIMONY. Hallett's. 100 lb. 11¢ 11 1/4¢ Cookson. 100 lb. 12¢ 12 1/4¢

SPALTER.—Duty: Pigs, Bars and Plates, \$1.50 per 100 lbs.

ZINC.—Duty: Pig or Block, \$1.50 per 100 lbs.

Zinc Tubing.—Dis. 25 s.

HABBIT METAL. N. P. U. B. 22¢; C. 14¢.

IRON WIRE.—Put up in 63 lb. bundles.

Stone or Weaving Wire. Nos. 10 to 11. 11 1/2¢ 12 1/2¢

Steel Wire. Cast Steel, Steel Wire list. dis. 50 s

Brass and Copper Wire. Old English Gauge the Standard. Dis. 20.

Common High Low Bronze Copper. All Nos. to No. 16.

MISCELLANEOUS TINNERS' STOCK. 1/2 & 3/4 Warranted. 13 1/2¢

Rivets. Iron and Tinned, new list, Dec. 10, 1881. dis. 45 s

Stove Bolts. American Screw Co.'s. dis. 60 s

GLASS. Prices current per box of 50 feet. List, July 2, 1883.

Double. 6 x 8 to 10 x 15. \$17.50 \$15.00 \$14.00 \$13.00

Single. 6 x 8 to 10 x 15. \$18.50 \$16.00 \$15.00 \$14.00

Double. 11 x 14 to 16 x 24. 30.00 28.00 26.00 24.00

Single. 11 x 14 to 16 x 24. 31.00 29.00 27.00 25.00

Double. 15 x 20 to 24 x 30. 25.00 23.00 21.00 19.00

Single. 15 x 20 to 24 x 30. 26.00 24.00 22.00 20.00

Double. 20 x 24 to 28 x 36. 20.00 18.00 16.00 14.00

Single. 20 x 24 to 28 x 36. 21.00 19.00 17.00 15.00

Double. 24 x 30 to 32 x 40. 18.00 16.00 14.00 12.00

Single. 24 x 30 to 32 x 40. 19.00 17.00 15.00 13.00

Double. 30 x 36 to 36 x 48. 15.00 13.00 11.00 9.00

Single. 30 x 36 to 36 x 48. 16.00 14.00 12.00 10.00

Double. 36 x 40 to 40 x 50. 12.00 10.00 8.00 6.00

Single. 36 x 40 to 40 x 50. 13.00 11.00 9.00 7.00

Double. 40 x 48 to 48 x 60. 10.00 8.00 6.00 4.00

Single. 40 x 48 to 48 x 60. 11.00 9.00 7.00 5.00

Double. 48 x 60 to 60 x 72. 8.00 6.00 4.00 2.00

Single. 48 x 60 to 60 x 72. 9.00 7.00 5.00 3.00

Double. 60 x 72 to 72 x 84. 6.00 4.00 2.00 1.00

Single. 60 x 72 to 72 x 84. 7.00 5.00 3.00 1.50

Mixed Shavings, part White. 2 1/2¢ 2 1/4¢

Black Lamp—Coach Painters. 100 lb. 22¢ 20¢

Black Paint, in oil. 100 lb. 22¢ 20¢

Chinese dry. 100 lb. 22¢ 20¢

Green Chrome. 100 lb. 22¢ 20¢

Mineral Paints. 100 lb. 22¢ 20¢

Red Lead, American. 100 lb. 22¢ 20¢

Venetian (Eng.) dry. 100 lb. 22¢ 20¢

Indian dry. 100 lb. 22¢ 20¢

Rose Pink. 100 lb. 22¢ 20¢

Sienna, American Raw, powdered. 100 lb. 22¢ 20¢

Burnt powdered. 100 lb. 22¢ 20¢

Raw, powdered. 100 lb. 22¢ 20¢

Vermilion, Chinese. 100 lb. 22¢ 20¢

White Lead, American, pure dry. 100 lb. 22¢ 20¢

White Lead, English prime, in blks. 100 lb. 22¢ 20¢

Yellow Ochre, French. 100 lb. 22¢ 20¢

Yellow Chrome. 100 lb. 22¢ 20¢

Zinc White, American No. 1 dry. 100 lb. 22¢ 20¢

French (Paris dry). 100 lb. 22¢ 20¢

Linseed, Raw, in casks and bls. 100 lb. 22¢ 20¢

Boiled. 100 lb. 22¢ 20¢

Calcutta. 100 lb. 22¢ 20¢

Bleached Whale, & cod. 100 lb. 22¢ 20¢

Sperm. 100 lb. 22¢ 20¢

Elephant. 100 lb. 22¢ 20¢

Prime Lard. 100 lb. 22¢ 20¢

No. 1 Extra. 100 lb. 22¢ 20¢

Drilling. 100 lb. 22¢ 20¢

Miners' Oil. 100 lb. 22¢ 20¢

No. 1 Pressed. 100 lb. 22¢ 20¢

Neatfoot. 100 lb. 22¢ 20¢

Tallow. 100 lb. 22¢ 20¢

Empire Cylinder Oil. 100 lb. 22¢ 20¢

Factories. 100 lb. 22¢ 20¢

Engines. 100 lb. 22¢ 20¢

HERMANN BOKER & CO.,

101 and 103 Duane Street, New York.

PROPRIETORS OF



WISE & TOOL WORKS.

PICKS, MATTOCKS, CRUB HOES, HAMMERS.

WROUGHT IRON STEEL FACE

(P. W. PATTERN.)

"FULLY WARRANTED."



Sole Agents for

H. BOKER & CO.'S Celebrated "Tree" Brand Cutlery,

WARD & PAYNE'S Sheep Shears (see their large advertisement in this issue),

GARDNER'S 1881 Razors,

AND

R. HEINISCH'S SONS'

Celebrated Tailors' Shears, Trimmers, Scissors, &c., Japanned and Nickel-Plated.

Every pair warranted.

GEO. WOSTENHOLM & SON'S, WADE & BUTCHER'S Pocket Cutlery and Razors.

JNO. WILSON'S Butcher Knives, Steels and Shoe Knives.

NEW ENGLAND CUTLERY CO.'S Table Cutlery.

W. BUTCHER'S Files and Tools,

GUNS AND PISTOLS, ARMS AND AMMUNITION.

MERWIN, HULBERT & CO.'S

AUTOMATIC

Double-Action Revolvers.



Turning the Barrel on the Center Stem and drawing it forward ejects all the Shells.

38 and 44 Calibre.

Both Pocket and Belt Size.

MANUFACTURERS ALSO OF THE LINE OF REVOLVERS KNOWN AS

Tramp Terrors, Rangers, Dictators, Blue Jackets

AND

X

election of the auditors, whose term of office will have expired.

"GEORGE WILSON, Chairman."
[The paid-up capital is £1,050,000; mortgage debentures, £430,500.]

FOREIGN.

FRANCE.

(Moniteur des Interets Matériels.)

PARIS, March 29, 1884.—Metals.—The Spring demand develops but slowly, but both Copper and Tin have been a little more active and higher. We quote at the close, in francs, per 100 kg.: Copper—Chili Bars, 140 @ 145; Ingots and Slabs, 151.25; Best Selected, 156.25; and Pure Corocoro Ore, 150.75. Banca, 226.25; Billiton, 231.25; Strates, 225; Australian, 225.75; and English, 223.75. Lead has declined 1.25 francs, and may now be quoted 27.50 @ 28.50. Silesian Spelter is 1 franc lower at Havre; we quote the same 38.50 @ 39. Iron.—The tendency remains downward in this city; a fresh decline has taken place during the week to 14.50 @ 14.75 francs in Merchant Iron, at which figure large dealings have occurred. As, however, a great many public works are to be carried out in Paris this summer, it is thought that better times are at hand; hence the greater readiness to take hold at the decline noted above. We quote Charcoal Merchant unaltered, 24; Sheets, 21 @ 22, and Wire Nails, No. 18, in bulk, 27. We are told from St. Dizier that the situation there has undergone no unfavorable change; the demand for immediate delivery remains brisk, keeping the rolling mills going to the full extent of their capacity. It is different with the foundries in that locality; they complain of insufficient work and unremunerative prices. In the North and East generally there is more talk of curtailing production, both of Pig and Finished until the situation shall become better defined. At any rate, the outlook, though not very encouraging, is decidedly less gloomy than it was a week ago. Coal has been firmer, and would be higher by this time but for the large accumulation of stock from a winter unusually mild.

BELGIUM.

(Moniteur Industriel.)

BRUSSELS, March 31, 1884.—Iron.—The better feeling and greater activity reported in our last weekly review have been maintained without leading to any further improvement in prices. Orders continue dropping in steadily, so that the bulk of makers in Belgium are busy, and have secured work enough to carry them into midsummer. This, however, relates to our rolling mills only, and not to the blast furnaces; hence the resolution to blow out two of them at Charleroi remains unshaken. Machine shops meanwhile might be busier. Steel works are tolerably busy; several large commands have been received by them. Cockerill has made several rail contracts with South America and Italy to the extent of some 20,000 tons during the week. Prices close very firm; we quote at the close: English Pig, 5.35 @ 5.40 francs per 100 kg.; Luxembourg, 5.30; and Charleroi, 5.25 @ 5.30. For puddling, we quote Common, 4.25 @ 5.25. Merchant Iron remains steady; No. 1 may be quoted 12 francs; No. 2, 12.75; No. 3, 13.50; Beams, 12.50; Corners, 13; Special Iron, 13.50. Sheets are unaltered; No. 5, 15.75; No. 8, 17.75; Commercial, 21.75; Thin, 22.75; and No. 4, 25.75. At Liège Pig Iron continues to sell at low figures, at between 4.10 and 4.90; two blast furnaces are to be blown out in the Hainaut region. Rolling mills are of good cheer there, and so are the rail-makers, in consequence of the contemplated formation of the Anglo-Belgian-German syndicate. Advances from Charleroi as regards Finished Iron are becoming more and more encouraging. Coal.—There is a decided improvement in the aspect of the market, although no advance has yet taken place.

GERMANY.

(Börsenhalles.)

HAMBURG, April 2, 1884.—Iron.—The market has continued to gain in liveliness, and prices have now an upward tendency. We quote on a firm market, deliverable at Düsseldorf: Prime Spiegel, 59 @ 62 marks per ton; White ditto, 57 @ 58; Luxembourg, 58; Foundry Pig, 67 @ 69 for Nos. 1 and 2, and for No. 3, 55; Spanish Muelde Foundry Pig, duty paid at Ruhrort, 76 @ 78; English, No. 3, there, 55; ditto Bessemer at port of shipment, 46 @ 47; Spanish Bessemer Muelde, cost, freight and insurance at Rotterdam, 57 @ 59; German Bessemer, 55 @ 56 marks. Merchant Iron is quoted at Düsseldorf, 115 @ 120, Common, and 140. Fine: Common Sheets, 160; Bolter, ditto, 170, and Thin 160 @ 165. Rolled Wire for Nail Nails is worth 122 @ 124. While in Rhenish Westphalia matters are improving, this cannot be said of Silesia, hitherto largely dependent on the export trade to Poland, for a year or so past hampered by the protective duty in Russia. Hence an outlet was to be found elsewhere in the neighborhood, and this has been to some extent accomplished by selling to the Austrian consumers in Bohemia, where the duties are more moderate than in Russian Poland; yet these sales had to go low, and, under the circumstances, the combination of rolling-mill owners in Upper Silesia could not be maintained. They are now free to undersell one another, and they do so, which causes continued weakness. Metals have been exceedingly dull. We quote English Pig, 13.50 @ 14 marks; ditto Sheets, 14 @ 14.50; German Pig, 11.75 @ 12; Spanish, 15. Copper has been quiet; Electrolytic at 74 @ 75; Lake Superior at 68; English, 65 @ 64; Tin, 93 @ 96; Spelter inactive at 15 @ 15.50, all in marks, per 100 lb.

HOLLAND.

(Koch & Plietboer.)

ROTTERDAM, March 27, 1884.—Tin.—The Netherlands Trading Society has sold at auction 22,500 slabs Banca at 52.25 @ 52.50 guilders per 50 kg., the average being 52.375. We quote at the close, Billiton, spot, 52.25, and 52 adroit.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, March 30, 1884.—Iron.—The market remains dull and depressed in consequence of the competition of Silesian Iron in the chief consuming districts in Austria proper, and the backward state of the spring season in this branch. We quote on a weak market: Pig Iron, 51 @ 58 florins per ton; Merchant, 115 @ 124; Sheets, 175 @ 180, and Beams, 135 @ 140. Austria produced last year 1,846,875 metrical cwt. Pig Iron, against 1,652,230 in 1882; 694,392 Merchant, against 739,045; 181,020 Sheets, against 167,895; 25,566 Thin ditto, against 24,388; 246,650 Steel Rails, against 228,035; 2,967 Hoops, against 684, and 146,039 other Steel, against 132,051. No change in Metals.

RUSSIA.

(Crotos.)

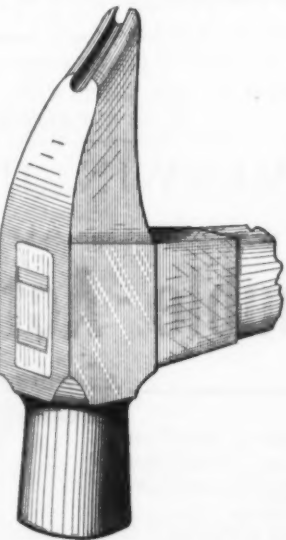
MOSCOW, March 31, 1884.—Iron.—The Government has sounded the Russian Chambers of Commerce about raising the Iron duties to 15 copecks gold, per pood, on Pig, and Finished in proportion. All have declared in favor of the measure with the exception of those of Idessa, Riga and Liban.

Massive Steel Forgings.—Sir Joseph Whitworth & Co., of Manchester, England have recently completed several large steel forgings made from their patent fluid-pressed steel. One of these is a solid forging which is to form the tube or barrel for a 63-ton gun; the length of this forging is 34 feet 7 inches, and the greatest diameter 29 inches. In the rough it weighed about 31 tons, and finished for boring, 28 tons. Among other gun material, Messrs. Whitworth are making hoops for 100 and 110 ton guns, and some of these weigh as much as 13 tons after they are rough-turned. The other large forgings just completed include two marine crank-shafts. One of these is for the Admiralty, and is a three-throw crank-shaft made solid. The length of the shaft is 28 feet 5 inches, the outside diameter 17 inches, with a hole through of 8 inches diameter, and the cranks have a throw of 24 inches, or equal

to 4-feet stroke. The weight of the crank was about 19 tons in the rough, and is 12½ tons finished. The second marine forging is a spare single-throw crank for the City of Rome. This is a built-up shaft in five pieces, shrunk together. The length of the shaft is 13 feet, diameter 25 inches, and of collar 45 inches. There is a 17-inch hole in the body and an 8-inch hole in the pins. The crank has a 36-inch throw, and weighs 21 tons.

The Hammer Nail Puller.

The accompanying illustration represents a combined hammer and nail puller, made under a patent of July 30, 1878, by George B. Curtiss, 95 Chambers street, New York, by whom it is now for the first time put on the market. The special feature in this tool is the application to a nail hammer of a patent claw adapted to draw nails by driving the claw under the head when flush with or sunk below the surface of the wood. To accomplish this it will be perceived that the points of the claws are near together, so as to admit of driving a short distance into the wood; that they are so formed as to hook under the head of the nail, and are made strong to guard against their breaking in use. Special attention also is directed to the fact that to start the nail there is a powerful leverage, the fulcrum being at first very near the end of the claws, but as the nail is lifted, and less power is required, it gradually moves toward the handle and face of the hammer. It is claimed that in this way ease and rapidity of working are secured. The manufacturer's directions for the use of this nail puller are as follows: To draw nails, set the claw close to the head of the nail, with the handle well down, and strike on the face a smart blow with a mallet. Use the claw to pry off the hoops. To draw finishing nails, set the claw across the grain against the side of the nail. Other advantages claimed for this article above other nail pullers are that it is



The Hammer Nail Puller.

practically noiseless in operation, and as a first-quality cast-steel adze-eye nail hammer is guaranteed to be equal to any that have been made. For information with reference to prices we refer our readers to the Trade Report.

Panama Canal Troubles.

Capt. James Wiltbank, who has recently returned from Panama, where he had been engaged on the canal, said recently, in conversation with a reporter of a Philadelphia paper, that over \$20,000,000 has been spent in establishing homes for the workmen along the route of the Panama Ship Canal.

Notwithstanding this enormous expenditure of money for the benefit of the workmen, the mortality appears to be something frightful, for, according to Captain Wiltbank's account, "men die like the leaves in autumn. Only the Italians appear to live. The dead are disposed of without ceremony. A shallow grave, no prayers, and all is in a moment forgotten. There are now 15,000 men at work on the canal, mostly negroes from Jamaica and the French West Indies. These negroes are brought over in droves as fast as those at work die, and I venture to say that not two-thirds of the 15,000 laborers now at work will be alive a year from now. It's dreadful. Five thousand died during the past three months; but the large pay tempts men to brave all the danger. The company appear to have an unlimited supply of money, and pay off every two weeks."

Regarding the progress that has been made on the canal, he says that "2½ miles of the canal proper has been dug out. Originally this section was dredged to a depth of 14 feet, but is now only 6 feet deep, the soft swamp lands pressed down by the weight of the dirt thrown out on either side filling in the canal from underneath. A great deal of work has, however, been done with the great steam shovels in leveling the high lands through which the canal is to pass, and dredging will soon be started in those sections. Work is now progressing upon the only large mountain which bars the way of the canal from ocean to ocean. This mountain is 400 feet high and 9 miles in circumference, and is to be cut down with steam plows and carted away. The company have been compelled to spend \$20,000,000, as I said, to locate homes through the swamps, from which as a basis the work of digging out the canal can be carried on. This work necessitated the building of railroad branches into the swamps, and the making of solid foundations with stone and gravel, hundreds of feet wide and miles in extent. Laborers get \$3 a day, and skilled mechanics and bosses from \$100 to \$350 a month." Captain Wiltbank does not think the canal will ever be finished unless the swamp sections are constructed with piling, and that would cost so large an amount of money that the scheme could not possibly pay.

Hydraulic Machinery in Buenos Ayres.—The following appeared in a recent issue of the Buenos Ayres Herald: The Great

Southern Railway have introduced hydraulic machinery into their goods sheds here, being the first ever worked in Buenos Ayres, in the form of 20 cranes for lifting wool from the wagons on to the upper floor, capstans for shunting the full wagons into the shed and taking them away when unloaded, also four traversers for changing the wagons from one road to another without having to disturb a whole train. This system of hydraulics is worked by two pairs of compound engines. The water is supplied from a tank in the engine-room, having a capacity of about 2000 gallons, and after this tank is once filled the water will last about a month; the water flows from the tank to the engines through pipes upon which the tank rests; the engines then pump the water into the two accumulators, which are two cylinders of 18 inches diameter and 20 feet long. Outside of this cylinder there is a shell which is belasted with about 70 tons of stone. When the engines pump the water into the cylinder it lifts the shell 19 feet by means of a ram which is attached to it, thus getting about 700 pounds to the square inch; the pressure is attached to the cranes, &c., by means of subterranean pipes—in all, about 4000 yards of piping. These engines are so arranged that the man in charge has only to open the steam valve when first starting, and when the accumulator has lifted 19 feet it stops them.

Condition of the Copper Trade.

The action of the Calumet and Hecla Company in passing its May dividend caused slight surprise among those engaged in the copper trade in this city. All suspicions, however, as to its solvency are ridiculed. The company is the largest in the country. Its first dividend was paid in 1870, and up to May 1, 1883, the total amount of dividends received by stockholders was \$23,350,000. The capital stock is \$2,500,000—100,000 shares of a par value of \$25. The market price at present is many times the original cost. Alexander Agassiz, son of Professor Agassiz, is the president. A gentleman in the city who is familiar with the affairs of the company, said recently:

"When we come to look at it from a business point of view, there ought not to be anything startling in the fact that the company has seen fit to pass a dividend. Lake Superior navigation closes in October. Still the mines go on producing during the winter season. By the 1st of May the company find themselves with the product of six months on hand, not immediately available. The company could in this case, if necessary, have borrowed money, and having a large surplus in copper they would have been perfectly justified in doing so; but as prudent business men they doubtless concluded to wait and realize on their product instead of borrowing. While I do not know the purposes of the company, it is not unlikely that they will make up during the year the dividend just passed. I have no doubt at all that the next quarterly dividend will be paid when due. The Calumet and Hecla are the largest company in the country. They employ 1650 men at the mines. The product of last month was the largest ever known in the Lake Superior region, being 2062 tons. In 1882, out of a total extracted from the Lake region of 56,000,000 pounds, this company produced 32,000,000, and in 1883, out of a total of 60,000,000 pounds, their yield was about 33,000,000. The copper is prepared for market in ingots weighing from 12 to 15 pounds, shipped in barrels weighing 1250 pounds net, also in plates weighing 150 pounds each, and in bars weighing 130 pounds each, the latter being rolled with special reference to the manufacture of wire. This wire has of late years come into great demand for electrical purposes, owing to the fact that it possesses higher conductivity than any other, being entirely free from impurities. In 1879 there were about 3,000,000 pounds of Lake Superior copper bars used, and in 1883 the figures closely approached 8,000,000 pounds; so you see what a marked increase there has been in this branch alone."

John Stanton, Jr., treasurer of the Atlantic and Central Mining Company, whose mines are about four miles from those of the Calumet and Hecla, said: "I wish the Calumet and Hecla owed me \$1,000,000. I would be very sure of getting it. I imagine that the only reason why they passed the May dividend was because they did not care to encroach upon their surplus. They have simply thought it expedient to pass this, and while I do not pretend to know anything about it, I am of the opinion that they will pay the next. There is no question as to their solvency. I have an idea that their surplus is about \$2,000,000, and their mines are producing more largely this year than ever before, though they are not getting quite as much for their products. There is no disguising the fact, however, that the tariff agitation is having a very prejudicial effect upon all manufacturing interests. They are being checked by the uncertainty hanging over everything, and, naturally enough, there is a decrease in the consumption of copper. The present price of Lake copper is 14½ cents for the best, and for commoner grades from 13¼ to 14¼ cents. This is a decrease of about 4 cents a pound, and it is due to this checking of manufacturers. At the same time there is no visible increase in the supply; but manufacturers will not take hold and buy. Statistically, however, copper is in a very good condition, and I do not think there is any cause for alarm. Other Lake Superior companies have reduced their dividends this year, preferring to do that rather than pass them altogether."

The sentiment of other dealers is in harmony with the expressions given. The exports continue to be considerable; little is imported, and this little only for the purpose of reducing and reshipping, in which case a drawback is allowed. Little Spanish or Portuguese copper enters this market. The passing of the dividend has stirred Boston society to its foundations. For 17 years no such untoward thing has happened to the owners of this famous copper bonanza, who have seen the shares for which they paid \$12 become worth \$250 apiece, and have received over \$20,000,000 in dividends in that time. This money has been the source of

much of Boston's outlay for art, science and discovery, and Quincy Shaw developed the mine, the property was distributed among a very select circle of Boston and Cambridge families, and there it has naturally remained, and but a few shares come out for sale even now, though the stock dropped instantly from about 230 to 180.

SCIENTIFIC AND TECHNICAL.

India-Ink.

A Chinaman named Chen-ki-souen has written a monograph on the famous Chinese ink, more commonly known as india-ink. The following extracts from the work regarding its history and preparation appeared in the Deutsche Industrie Zeitung:

According to Chen-ki-souen, a kind of pigment ink was discovered 2697 to 2597 B. C. It was employed for writing on silk with a bamboo rod. Afterward an ink was prepared from a certain stone (encre de pierre) which is still known in China as "che-hei." It was not until 260 or 220 B. C. that they began to make an ink from soot or lamp-black. The soot was obtained by burning gum lac and pine wood. This ink was made first in round balls, and very soon supplanted the stone ink. For a while the Province of Kiang-si appears to have had a monopoly of ink-making. Under the dynasty of Tang, in 618 to 905 A. D., there was a special officer, called an inspector, who had charge of its manufacture. He had to furnish the Chinese court with a certain quantity of this ink annually. Some of the factories seemed to have been "royal Chinese" factories. The Emperor Hian-tong (713 to 756 A. D.) founded two universities, to which he sent 336 balls of ink four times a year. The most celebrated ink factory in China is that of Liting-kouei, who lived in the latter part of the Tang dynasty, and is said to have made an excellent article. He made his ink in the shape of a sword or staff, or in round cakes. The test of its authenticity consisted in breaking up the rod and putting the pieces in water; if it remained intact at the end of a month, it was genuine Liting-kouei. Since the death of this celebrated man there seems to have been no perceptible advance made in the manufacture of india-ink.

In the manufacture of lampblack nearly everything is used that will burn. Besides pine wood, we may mention petroleum, oils obtained from different plants, perfumed rice flour, bark of the pomegranate tree, rhinoceros horn, pearls, musk, &c. Nor does fraud seem to have been entirely wanting. According to Chinese authorities, the principal thing is the proper preparation of the lamp-black; the best smells like musk, and the addition of musk not only serves to give poor goods the resemblance of fine ones, but really makes it worse. The binding agent plays the chief part next to the lampblack; ordinary glue and isinglass alone are now used. In old times, glue made from the horns of the rhinoceros and of deer was employed. Good Chinese ink improves with age, and should not be used for a few years after it is made. It is not easy to keep, as it must be protected from moisture. Some persons, in rubbing it up, make circular movements that soon ruin it. It is better to rub it in straight lines, back and forth, with the least possible pressure.

History of Thermometers.

At the meeting of the Royal Meteorological Society, held on March 19, the president, Mr. R. H. Scott, F. R. S., read a paper entitled "Brief Notes on the History of Thermometers," in which he said that the name of the actual inventor of the instrument is unknown. The earliest mention of it, as an instrument then 50 years old, was in a work by Dr. R. Flood, published in 1638. Bacon, who died in 1626, also mentions it. The earliest thermometers were really sympiesometers, as the end of the tube was open and plunged into water, which rose or fell in the tube as the air in the bulb was expanded or contracted. Such instruments were, of course, affected by pressure as well as temperature, as Pascal soon discovered. However, simultaneously with such instruments, thermometers with closed tubes had been made at Florence, and some of these old instruments were shown at the loan collection of scientific apparatus at South Kensington in 1876. They are in the collection of the Florentine Academy, and in general principle of construction they are identical with modern thermometers. Passing on to the instrument as we now have it, Mr. Scott said that most of the improvements in construction in the earliest days of the instrument were due to Englishmen. Robert Hooke suggested the use of the freezing point, Halley the use of the boiling point and the employment of mercury instead of spirit, and Newton was the first to mention blood-heat. Fahrenheit was a German by birth, but was a protégé of James I., and died in England. Réaumur's thermometer, in its final form, owes its origin to De Luc, while the centigrade thermometer, almost universally attributed to Celsius, was really invented by Linnaeus. Celsius's instrument had its scale the reverse way, the boiling point being 0° and the freezing point 100°.

Measuring the Dilatation of Small Bodies.

M. Thoulet has communicated to the French Academy of Sciences an ingenious method of measuring the coefficient of cubical dilatation of solids in very small fragments. He employs for the purpose a solution of iodide of mercury in iodide of potassium, which has in a concentrated state a specific gravity of 3.1, but which he prefers to use at a specific gravity of 2.75 or 2.85. M. Goldschmidt has measured the coefficient of dilatation of this liquid for various degrees of concentration. Thus for 3.1 sp. gr., the coefficient of dilatation α is .0004875, for 2.7 sp. gr. α is .0005256, for 2.8 sp. gr. α is .0005222. The solid to be measured is placed in a test glass containing the solution in question in a concentrated form, and water is added till it neither sinks nor swims, but remains in equilibrium in the liquid. The density of the liquid and the body is then equal. The temperature t and the density d of the liquid is then observed. A small quantity of the concentrated liquid is then added and a new density, D , obtained. As D is greater than d , the body rises above the surface and the temperature is raised to t' ,

"culture" generally. When young Agassiz when the body and the liquid are again in equilibrium. From these data the volume of the body at t' or $V = [1 + \alpha(t' - t)]d$.

The increase of volume is therefore $V - 1$ for a difference of temperature $t' - t$.

End of a Long Strike.

They, April 16.—The Molders' Union today accepted a reduction of 20 per cent. from last year's prices, and all the foundries will start up at once, after a deadlock of three months. This affects about 2000 men.

An awkward typographical error occurred in one of our "Industrial Items" last week. In referring to the steel works of Isaac G. Johnson & Co., at Spuyten Duyvil, N. Y., the following statement was made: "They have facilities for turning out castings of 6000 tons each." While Messrs. Johnson & Co. claim the ability to turn out heavy castings, they hardly expect to make such extraordinary work as this. The word "tons" should have been "pounds."

THE CLEVELAND

Storage Company,

Capital Stock, \$200,000.00.

We are prepared to receive **PIG IRON**, **BLOCKS**, **INGOTS**, **MUCK-BAR**, **BAR** and **SHEET IRON**, **Car Wheels**, **Rails**, **LUMBER**, **ORE**, &c., also every kind of merchandise, on storage. Warrants will be issued on all stock received, made transferable by indorsement and deliverable to the holder on demand. These warrants will furnish a convenient medium of transfer and delivery, and serve as collateral to parties wishing advances on their stock. We shall be glad to furnish full particulars as to the manner of transacting business, and invite correspondence or personal interview.

W. R. DRAKE, Sec.
Room 68, Wilshire Block.



60 to 70 BUSHEL

SUPERIOR CHARCOAL

Are obtained from one cord of wood by the Use of

MATHIEU'S PAT. RETORTS,

AND ALL THE ACETIC VAPORS COLLECTED.

These Retorts are now operated in connection with Blast Furnaces and Forges, and experience has demonstrated that an increase of 16 per cent. of blast pressure and 25 per cent. of burden in the Furnace is possible with coal made in these retorts, over that made in kilns or mellers.

The charcoal produced is clean and dry, and being discharged into cooling tanks, the breakage is reduced to a minimum. It weighs 21 pounds per bushel.

176 of these RETORTS are Now Erected, and Others are Being Constantly Added.

ADDRESS,
J. A. MATHIEU,
Nos. 51 and 52 Moffat Block, DETROIT, MICH.

PITTSBURGH TOOL CO.,

SUCCESSORS TO

ALKER & CROMLISH,

Twist Drills, Reamers, Taps and

MACHINISTS' SPECIAL TOOLS,

Machine, Car and Bridge Bolts, Set and Cap

Screws, Boiler Rivets, &c.

LIGHT MACHINE FORGING A SPECIALTY.

P. O. Box 1060, Pittsburgh, Pa.

FABRIK:

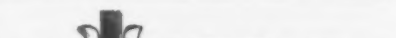
Corner North & Irwin Avenues, Allegheny, Pa.

REVOLVERS.

Sold by Gun and Hardware

Trade Everywhere.

OTIS A. SMITH, Manufacturer, Rockfall, Ct.



(New Tool)

THOMAS J. ANDRESS,

MANUFACTURER OF

GLASS CUTTERS,

221 Cherry Street, PHILADELPHIA, PA.

The Iron Age Directory

And Index to Advertisements.

Adjustable Links.	PAGE
Ewald Over, Indianapolis, Ind.	3
Agricultural Implements.	
Smith & Bro. Wm. Co., Jackson, Mich.	14
Withington & Cooley Mfg. Co., Jackson, Mich.	43
Air Compressors.	
Clayton Steam Pump Works, Brooklyn, N. Y.	50
The Norwalk Iron Works Co., Norwalk, Conn.	50
Alarm Money Drawers.	
Onida Alarm Till Co., East Syracuse, N. Y.	12
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.	47
Anti-Friction Metals.	
Du Plaine & Co., Chicago, Ill.	52
Reeves Paul S., Philadelphia.	52
Arms, Manufacturers of.	
Baker Hermann & Co., 101 and 103 Duane, N. Y.	29
Cheney Arvi & Vile, Detroit, Mich.	49
Field, Alfred & Co., 91 Chambers, N. Y.	49
Flaner & Norris, Trenton, N. J.	9
Arms and Ammunition.	
The Alford & Berkeley Co., 77 Chambers, N. Y.	33
Conway T. G., 88 Chambers, N. Y.	33
Hutchinson J. W., 8 Chambers, N. Y.	33
Merwin, Bulfinch, 88 Chambers, N. Y.	33
Schoverling, Day & Co., 81 & 83 Chambers, N. Y.	33
Smith, Otis A., Rockville, Conn.	33
Stevens & Co., Chicopee Falls, Mass.	33
Artesian Well Supplies.	
Levey, John F., 101 Reade, N. Y.	43
Asbestos.	
The Asbestos Packing Co., Boston, Mass.	39
Augers and Bits.	
Farneburg C. E. & Co., 95 Chambers, N. Y.	33
Tennis & Wilson, 201 Broadway, N. Y.	40
Axles, Springs, &c., Manufacturers of.	
Cook R. & Sons, Winsted, Conn.	13
Gaudier Steel Dpt. of Cambria Iron Co., Johnstown, Pa.	36
Liggett Spring and Axle Co., Pittsburgh, Pa.	8
Wurster F. W., Brooklyn, N. Y.	8
Axes.	
Peck A. G. & Co., Cohoes, N. Y.	52
Bakers.	
P. W. Gaudier & Co., 2 Wall, N. Y.	9
Barb Wire and Fence.	
Hawkey Steel Barb Fence Co., Burlington, Iowa.	3
Iowa Barb Wire Co., Liberty, N. Y.	3
Ohio Steel Barb Fence Co., Cleveland, O.	4
Ohio Wire Hedge Co., Chicago, Ill.	4
Washburn & Moen Mfg. Co., Worcester, Mass.	2
Bellows, Manufacturers of.	
Bullock T. H., Cleveland, O.	8
Flaccus Wm. & Son, Pittsburgh, Pa.	50
Scott Geo. H., Chicago, Ill.	49
Bells.	
The Miller Co., Canton, O.	49
Bells (Sleigh).	
Revin Bros. Mfg. Co., Easthampton, Conn.	41
Belt Fasteners.	
Sayre L. A., Newark, N. J.	10
Belting, Makers of.	
Alexander Bros., 412 N. 3d, Philadelphia.	19
Main Belting Co., Philadelphia, Pa.	27
K. B. Beltine and Packing Co., New York, N. Y.	27
Page Belting Co., Concord, N. H.	43
Belt Oil. —Post E. L. & Co., 10 Peck Slip, N. Y.	33
Bicycles.	
Pope Mfg. Co., 497 Washington, Boston.	52
Bit Cases, Makers of.	
Landman O. Co., 24 Pearl, N. Y.	3
Maxwell John, 247 and 249 Pearl, N. Y.	7
Bit Braces.	
Maxwell E. R., Buffalo, N. Y.	12
Blasting Materials.	
Hercules Powder Co., Cincinnati, O.	39
Blind Sewing Machines.	
North F. & Co., Boston, Mass.	40
Blocks, Ties and Sleepers.	
Bagnall & Laid, Boston, Mass.	50
Cleveland Block Co., Cleveland, O.	35
Detroit Block Works, Detroit, Mich.	7
McCoy & Sanders, 20 Warren, N. Y.	7
McMillan Wm. H. & Bro., 113 South, N. Y.	12
Penfold Block Co., Lockport, N. Y.	12
Reed Mfg. Co., Canajoharie, N. Y.	35
Boiler Feeders.	
The Miller Co., Canton, O.	49
Boilers, Makers of.	
Babcock & Wilcox Co., 30 Cortlandt, N. Y.	74
Deere Moore Iron Company, 73 Liberty, N. Y.	14
Harrison Boiler Works, Philadelphia, Pa.	51
Boiler Plates.	
Wm. McIlwain & Sons, Reading, Pa.	36
Seldin, Hastings & Co., Mount Carmel, Del.	77
Boiler and Rivet Clippers.	
Chambers, Brother & Co., Philadelphia, Pa.	14
Bolt Cutters.	
Howard Iron Works, Buffalo, N. Y.	51
Bellows Wm. & Co., Phila., and 79 Liberty st., N. Y.	51
Wiley & Russell Mfg. Co., Greenfield, Mass.	34
Bolt for Bolts.	
Green E. L. & Co., 112 Murray, N. Y.	29
Brass, Manufacturers of.	
Ansonia Brass and Copper Co., 10 Cliff, N. Y.	28
Bridgeport Brass Co., Bridgeport, Conn.	2
Brown & Bros., 81 Chambers, N. Y.	2
Devil John & Sons, 100 John, N. Y.	2
Holmes, Booth & Hayden, 49 Chambers, N. Y.	2
Plume & Atwood Mfg. Co., 18 Murray, N. Y.	2
Rome Iron Works, Bridgeport, Conn.	2
Seavill Mfg. Co., 21 Broome, N. Y.	2
Waterbury Brass Co., 29 Broadway, N. Y.	2
Waterbury Mfg. Co., Waterbury, Conn.	3
Brass Butt Hinges.	
Tiebout W. & Co., 16 and 18 Chambers, N. Y.	27
Brass Foundries.	
McFarland & Sons, Trenton, N. J.	51
Reeves Paul S., Philadelphia.	52
Reynolds Martin, Brooklyn, E. D., N. Y.	50
Bridge Builders.	
Mosley Iron Bridge and Roof Co., 4 Day, N. Y.	4
Union Bridge Co., 99 Wall, N. Y.	40
Brushes.	
Grummel Brush & Wire Goods Co., Cincinnati, O.	3
Buckets, Pump and Elevator.	
Crosby A. D., Cuba, N. Y.	47
Clark W. J. & Co., Salem, O.	47
Rowland T. F., Brooklyn, N. Y.	47
Builders' Hardware.	
Clark Mfg. Co., Buffalo, N. Y.	47
Nimick & Brittan Mfg. Co., Pittsburgh, Pa.	27
Butcher and Shoe Nails, Manufacturers of.	
Wilson John & Sons, England.	10
Butts and Hinges.	
Smith & Edge Mfg. Co., Bridgeport, Conn.	34
Stanley Works, 100 Chambers, N. Y.	34
Union Mfg. Co., 95 Chambers, N. Y.	34
Car Axles.	
Roberts A. P. & Co., 25 & 27 4th, Philadelphia.	5
Carriage Hardware, Makers of.	
Townsend, Wilson & Hubbard, Philadelphia.	49
Smith H. D. & Co., Plantville, Conn.	13
Woodruff, Miller & Co., Mount Carmel, Del.	77
Carts. —C. Spring Cart Co., Rushville, Ind.	13
Car Wheels.	
Union Foundry and Pullman Car Wheel Works, Chicago, Ill.	12
Carpet Sweepers.	
Basell Carpet Co., Chester, Pa.	9
Casters. —Phoenix Caster Co., Indianapolis, Ind.	9
Payson Mfg. Co., Chicago, Ill.	10
Cauls, Brass and Iron.	
Moore S. L. & Sons, Elmhurst, N. J.	15
Cauls, Iron.	
S. Cheney & Son, Manlius, N. Y.	27
Devlin Thos. & Co., Chester, Pa.	7
Haug & Clark, Albany, N. Y.	7
Hammer & Co., Branford, Conn.	30
North Brothers, Bridgeport, Conn.	5
Syracuse Malleable Iron Works, Syracuse, N. Y.	5
Casting, Steel.	
Chester Steel Castings Co., 407 Liberty, Phila., Pa.	53
Bureau Steel Castings Co., Chester, Pa.	53
Stanley G. & Co., Philadelphia.	53
Johnson I. G. & Co., Spuyten Duyvil, N. Y.	53
Kinchin, Hempel & Co., Pittsburgh, Pa.	53
Pittsburgh Steel Casting Co., Pittsburgh, Pa.	53
Standard Steel Casting Co., Thurlow, Pa.	53
Chains, Manufacturers of.	
Bradley & Co., 16 Richmond St., Phila., Pa.	49
Wm. H. Haskell Co., Pawtucket, R. I.	49
Chain Saws.	
National Wire and Iron Co., Detroit, Mich.	3
Chemicals.	
Haines R., Philadelphia.	5
Chemicals.	
Elmer & Amend, 203 Third Ave., N. Y.	49
Cherry Mfg. Co., Phila. Pa.	49
Chisels, Manufacturers of.	
Buck Bros., Millbury, Conn.	13
Clay Pumps and Traps.	
The Clay Pumps Co., Cincinnati, O.	50
Clay Springs, &c.	
Dunbar Bros., Bristol, Conn.	7
Clothes Dryers.	
Hill Dryer Co., Worcester, Mass.	10
Cool, Miners.	
Pardee A. & Co., 111 Broadway, N. Y.	44
Cooling and Splice Mills.	
Lease Brothers, Quakertown, N. Y.	43
Enterprise Mfg. Co., Philadelphia, Pa.	43
Coke. —Schonmaker J. M., Pittsburgh, Pa.	14
Cooking and Chilling, Manufacturers of.	
Bemis & Call Hdw. & Tool Co., Springfield, Mass.	30
Stevens J. & Co., Chicopee Falls, Mass.	30
Copper. —Brown & Bros., 81 Chambers, N. Y.	2
How Haven Copper Co., 20 Pearl, N. Y.	2
Pope, Cole & Co., Baltimore, Md.	2
Cordage.	
Lease Brothers, Quakertown, N. Y.	43
Cornice Machines.	
Calvin Carr, Bridgeport, Conn.	41
Corrugated Sheet Furnaces.	
Hartmann, Le Bon & Mack.	41
Corrugated Iron.	
Cincinnati Corrugating Co., Cincinnati, O.	4
Mosley Iron Bridge and Roof Co., 4 Day, N. Y.	4

Coverings, Holes and Piles.	
Chambers Spence Co., 23 John St., N. Y.	41
Shields & Brown, Chicago, Ill.	40
Cranes.	
Vale & Towne Mfg. Co., Stamford Conn.	11
Crating, Iron.	
Roller J. E. & Co., Detroit, Mich.	3
Crapsin's Awt.	
Millers Falls Co., 71 Chambers, N. Y.	52
Crucibles.	
Seidel J. B., Philadelphia, Pa.	47
Cupolas.	
Smith & Sayre Mfg. Co., 245 Broadway, N. Y.	41
Curry Combs.	
Ray Hubbell, Northville, N. Y.	30
Cutlery, Importers of.	
Boyer Hermann, 101 Duane, N. Y.	29
Butcher W. & S., Sheffield, England.	10
Conway T. G., 88 Chambers, N. Y.	33
Clatworthy F. & Co., Chambers, N. Y.	49
The Alford & Berkeley Co., 77 Chambers, N. Y.	33
Cutlery, Manufacturers of.	
Bannister A. & Co., Newark, N. J.	10
John Russell, 101 Duane, N. Y.	29
Yough & Williams, 288 Greenwich, N. Y.	4
Diaper Pail and Lantern.	
Haight Joseph, Port Chester, N. Y.	8
Do Collars.	
National Wire, 114 Chambers, N. Y.	35
Door Hangers, House and Barn.	
Lovejoy John F., 101 Reade, N. Y.	10
Loore S. H. & E. Y., Chicago, Ill.	10
Seneca Mfg. Co., Seneca Falls, N. Y.	39
Stearns E. C. & Co., Syracuse, N. Y.	39
Victor Mfg. Co., Newburyport, Mass.	14
Walter J. B., Chicago, Ill.	14
Drilling Machines, Makers of.	
Clark, Sime & Co., Springfield, O.	52
Balliet Thos. H., Philadelphia, Pa.	52
Peoples Clark & Shear Co., 38 W. Day, N. Y.	51
Wiley & Russell Mfg. Co., Greenfield, Mass.	34
Drop Forgings.	
The Billings & Spencer Co., Hartford, Conn.	12
Brown R. H. & Co., Westville, Conn.	12
Chicago Forging Co., Chicago, Ill.	35
William Ross & Bro., West Phila., Pa.	7
Drop Hammers.	
Williams, White & Co., Moline, Ill.	6
Heartley Geo. W., Toledo, O.	48
Edge Tools, Makers of.	
Roebuck & Co., Chambers, N. Y.	49
White, L. & J., Buffalo, N. Y.	42
Elevators, Makers of.	
Crane Bros. Mfg. Co., Chicago, Ill.	41
Otto Bros. & Co., 92 and 94 Liberty, N. Y.	49
Stokes & Parrish, Philadelphia.	40
Emery Wheels.	
Walpole Emery Mills, South Walpole, Mass.	27
Engines and Pumps.	
Union Stone Co., Boston, Mass.	41
Engines and Pumps.	
Simple H. M., Philadelphia, Pa.	51
Engines, Locomotive.	
Baldwin Locomotive Works, Philadelphia, Pa.	6
Engines, Steam, Makers of.	
Ball Engine Co., Erie, Pa.	49
Booke & Co., 101 Chambers, N. Y.	49
Ervin Chas. & Co., Philadelphia.	49
Noteman Rotary Engine & Pump Co., Toledo, O.	51
Rumsey L. Mfg. Co., St. Louis, Mo.	48
Southward Foundry & Machine Co., Philadelphia.	48
The Cummer Engine Co., Cleveland, O.	39
N. Y. Safety Steam Power Co., 30 Cortlandt, N. Y.	30
The Norwalk Iron Works Co., Norwalk, Conn.	50
The Pusey & Jones Co., Wilmington, Del.	50
The Westinghouse Machine Co.,	50
Wetherill, 101 Chambers, N. Y.	50
Engravers, Wood.	
Madous O. W., 23 Park Row, N. Y.	27
Expanding Makers.	
Cooke & Co., 20 Cortlandt, N. Y.	9
Facings, Foundry.	
Emmerich J. A., Philadelphia, Pa.	3
Obermayer & Co., Cincinnati, O.	3
Paxson J. W. & Co., 54 Beech, Phila.	4
Farmers' Tools.	
Beller & Bros., Newark, N. J.	4
Faucets, Makers of.	
McNab & Harlin Mfg. Co., 30 Gold, N. Y.	49
John Sommers & Sons, Newark, N. J.	49
Faucets, Self-Measuring.	
Enterprise Mfg. Co., of Phila. and N. Y.	40
Dane Bros., Poughkeepsie, N. Y.	41
Fences, Fencing.	
E. T. Barnum Wire and Iron Works, Detroit, Mich.	14
East, Foss & Co., Springfield, O.	14
National Wire Co., Detroit, Mich.	3
Fencing and Creating.	
Bolles J. E. & Co., Detroit, Mich.	3
Fires, Importers of.	
Carr J. & Riley & Co., N. Y.	14
Fraser & Co., 40 Chambers, N. Y.	14
Montgomery & Co., New York, N. Y.	14
Moss E. W., 80 John, N. Y.	14
Files, Manufacturers of.	
Arnold & E. L., 41 and 43 Richmond, Phila.	8
Detroit File Works, Detroit, Mich.	8
Everhart James M., Scranton, Pa.	52
Hessner Christian, Philadelphia, Pa.	52
McCaffrey & Bro., 123 and 125 N. 4th, Phila.	52
New American File Co., Pawtucket, R. I.	54
Nicholson File Co., Providence, R. I.	54
Paul & Co., Williamsburgh, N. Y.	54
Spencer, Mathias & Sons, Sheffield, England.	50
Union File Works, Baltimore, Md.	8
Fire Brick.	
Bornier & O'Brien, Philadelphia, Pa.	42
Climax Fire Brick Co., Pittsburgh, Pa.	42
Garrett James, Philadelphia, Pa.	42
Kreischer & Sons, Foot of 12th St., Phila.	42
Newton & Co., Albany, N. Y.	42
Ostrander James & Son, Troy, N. Y.	42
Union Mining Co., New York, N. Y.	42
Valentine M. D. & Bro., Woodbridge, N. J.	42
Watson Fire Brick Co., Perth Amboy, N. J.	42
Westborough Fire Brick Co., Reading, Pa.	42
Woodland Fire Brick Co., Woodland, Pa.	42
Fishing Tackle.	
James, Kendall, Boston, Mass.	10
Mallison F., Brooklyn, E. D., N. Y.	10
Fittings, Malleable and Gray Iron.	
Star Machine Works, Cleveland, O.	50
Fire Scrapers.	
Jackson File Scraper Co., Jackson, Mich.	45
Forging, Portable, &c.	
Bradley & Co., N. Y.	52
Buckeye Forge Co., Cleveland, O.	12
Buffalo Forge Co., Buffalo, N. Y.	12
Clark W. J. & Co., Salem, O.	47
Empire Portable Forge Co., Cohoes, N. Y.	41
Pope Mfg. Co., Springfield, O.	41
Reynolds Martin, Brooklyn, E. D., N. Y.	50
Huyett & Smith Mfg. Co., Detroit, Mich.	49
Keystone Portable Forge Co., 212 Carter, Phila.	14
Forging, Iron.	
Enterprise Iron Steel Co., Dauphin, Pa.	12
Enterprise Iron Steel Co., Pittsburgh, Pa.	12
Foundry Supplies.	
Smith & Edge Mfg. Co., Philadelphia, Pa.	3
Furnace Hoists.	
Stokes & Parrish, Phila., Pa.	40
Gas Generators.	
National Gas and Mfg. Co., Cleveland, O.	14
Gates, Folding.	
Compton Folding Works Co., 93 Church, N. Y.	3
Gear Wheels.	
Brown & Sharpe Mfg. Co., Providence, R. I.	48
Glass Chisels.	
Anders & Tins, Philadelphia, Pa.	39
Glue.	
Russell Cement Co., Gloucester, Mass.	34
Grain Grinders.	
Iowa Farming Tool Co., Fort Madison, Iowa.	27
Seymour Mfg. Co., St. Louis, Mo.	27
Grates, Bar.	
Creswell David S., Philadelphia, Pa.	51
Rocking Grate Bar Co., Chicago, Ill.	39
Grindstones.	
Lombard & Co., Boston, Mass.	40
McDermott & Berea Stone Co., Cleveland, O.	40
Ohio Grindstone Co., Cleveland, O.	40
Sargent & Co., Boston and New Haven, Conn.	40
Worthington & Sons, Cleveland, O.	40
Gunpowder, Makers of.	
Ladin & East Power Co., 29 Murray, N. Y.	8
Gun, Pistols, &c.	
Kittredge B. & Co., Cincinnati, O.	10
Hammer.	
Millers Falls Co., 71 Chambers, N. Y.	52
Hammers, Steam.	
Bradley & Co., Syracuse, N. Y.	52
Hand and Vise.	

(For Wholesale Metal Prices, See Page 29.)

Nails.					
Melting, Sargent's.....	dls	50	80	5	
Melting, Reading.....	dls	50	80	5	
Melting, P. & W.....	dls	50	80	5	
Melting, P. S. & W.....	dls	50	80	5	
Eberhard Mfg Co.....	dls	33	95		
Tubular, Standard No. 0.....	per doz	\$7	50		
Tubular, Standard No. 1.....	"	doz	9	00	
Tubular, Standard No. 2.....	"	doz	10	00	
Tubular, Life Wire No. 1.....	per doz	10	00		
Guards for Tubulars.....	add per doz	.25			
Hall City.....	No. 100 \$10.00; No. 2, 8 A, net				
Hurricane, No. 2.....	per doz \$10.75, net				
Hessels, No. 1.....	per doz \$11.75, dis 10%				
Jenna.....	dls 10	80	5		
Yankee.....	dls 10	80	5		
Police Small, \$3.50; Med., \$7.75; Large, \$10.00, dis 10%					
Convey Receptor.....	\$2.7	per lot,	dls 14	5	
Excelsior.....	dls 3	8	0	5	
Clipper.....	dls 3	8	0	5	
Continental.....	dls 3	8	0	5	
Philadelphia.....	dls 3	8	0	5	
Sawyers.					
Permain Lined.....	per doz \$5.00, dis 15%				
Wood.....	per doz 5.00, dis 15%				
Darpan's Improved.....	per doz 5.00, dis 15%				
Bammis.....	No. 1, \$3; 2, \$5; 12, \$15 per doz.....	dls 20	80	5	
Townsend's Patent.....	\$5.00 per doz, dis 15%				
The "Boss".....	per doz \$10.00, dis 10%				
Dean's No. 1.....	per doz \$10.00, 2, \$5.00, 3, \$5.00, dis 10%				
Cotton Chalk.....	dls 10	80	5		
Silver Lake, Braided, Nos. 0, \$5.00; No. 1, \$5.50; No. 2, \$6.00.....					
Masons' Linen, No. 35, \$1.50; No. 4, \$1; No. 5, \$1.....	net				
Wire Clothes, Galvanized.....	each 25c @ 20c net				
Locks and Latches.					
Cabinet, Gaylord.....	Changes made at list price of numbers March 10,				
Cabinet, F. & E. Corbin.....	1894, dls 4	4	2	5	cash.
Cabinet Stockador.....	dls 3	0	0	5	
A. E. Deitz, Flat Key Drawer.....	dls 3	0	0	5	
Shepard's Standard Drawer and Desk.....	dls 4	0	0	5	
"Shepherd's" C. S. S.....	dls 4	0	0	5	
"Felter" or "American".....	dls 4	0	0	5	
Eagle Trunk.....	dls 14	5	0	5	
Branford.....	LOCKS, ETC.				
Norwalk.....					
Norwich.....					
P. & F. Corbin.....					
Nashua.....	Dls 6	8	2	5	cash, from Revised List of Dec. 10, 1893
Bedford Patent Lock Co.....					
Mallory, Wheeler & Co.....					
Nimble & Brittan Hard-ware Co.....					
Whipple Mfg Co.....					
Reading Hardware Co. (rev. list Jan. 2, '84), dis 6	10	%			
F. May Jr.....	dls 33	95			
Barnes Mfg. Co.....	dls 4	0	0	5	
Yale Flat Key.....	dls 40	5			
Langstroth & Crane's.....					
Round Key Latches.....	dls 2	0	0	5	
Flat Key Latches.....	dls 2	0	0	5	
PADLOCKS.					
Russell & Erwin.....					
Nimble & Brittan Mfg. Co.....	Dls 4	5	2	5	cash, from Revised List of Dec. 10, 1893
Norwich Lock Co.....					
Yale Lock Mfg. Co.'s "Standard".....	dls 45				
Komer.....	dls 25				
Castoria.....	dls 10				
Constance & Moore Bros.....	dls 10				
J. McWilliams.....	dls 10				
A. K. Dietz.....	dls 15				
Franklin.....	dls 15				
Barnes Mfg. Co.....	dls 40				
Luxair.....	3 do bottles, \$5.00; 5 do, \$7.75 gross \$17.50 net				
Lignumvitae.....	dls 10	80	5		
Penfold Block Co. Lignumvitae & Hickory.....	dls 5	0			
DIXON'S PATENT P. S. & W. Nails.					
Price.....	\$12.00	17.00	19.00	30.00	dis 25% 5
Perry's No. 1.....	3	4	4	8	7d 5 cnd
Woodruff's (P. S. & W.).....	No. 10.....	dls 30	00	dis 15	5
Hales.....	No. 10.....	dls 30	00	dis 15	5
Draw Cut.....	No. 5.....	0	8	10	
American.....	No. 1.....	0	8	10	
Enterprise.....	No. 1.....	0	8	10	
Kieser's Gem.....	No. 1.....	0	8	10	
Kieser's Monarch.....	No. 1.....	0	8	10	
Miller & Deming.....	No. 1.....	0	8	10	
Gennyfrania.....	No. 1.....	0	8	10	
Shelf Shavers (Enterprise).....	No. 1.....	0	8	10	

Post Hole and Tree Augers.	
Samson Post Hole Auger.....	\$1.00 to \$2.00
Fletcher Post Hole Auger.....	\$1.00 to \$2.00
Vaughan's Post Hole.....	\$1.00 to \$2.00
6 in. 25¢; 7, 8 and 10 in. 35¢; 12 in. 50¢; 14 in. 75¢; 16 in. 1.00; 18 in. 1.25; 20 in. 1.50; 22 in. 1.75; 24 in. 2.00; 26 in. 2.25; 28 in. 2.50; 30 in. 2.75; 32 in. 3.00; 34 in. 3.25; 36 in. 3.50; 38 in. 3.75; 40 in. 4.00; 42 in. 4.25; 44 in. 4.50; 46 in. 4.75; 48 in. 5.00; 50 in. 5.25; 52 in. 5.50; 54 in. 5.75; 56 in. 6.00; 58 in. 6.25; 60 in. 6.50; 62 in. 6.75; 64 in. 7.00; 66 in. 7.25; 68 in. 7.50; 70 in. 7.75; 72 in. 8.00; 74 in. 8.25; 76 in. 8.50; 78 in. 8.75; 80 in. 9.00; 82 in. 9.25; 84 in. 9.50; 86 in. 9.75; 88 in. 10.00; 90 in. 10.25; 92 in. 10.50; 94 in. 10.75; 96 in. 11.00; 98 in. 11.25; 100 in. 11.50; 102 in. 11.75; 104 in. 12.00; 106 in. 12.25; 108 in. 12.50; 110 in. 12.75; 112 in. 13.00; 114 in. 13.25; 116 in. 13.50; 118 in. 13.75; 120 in. 14.00; 122 in. 14.25; 124 in. 14.50; 126 in. 14.75; 128 in. 15.00; 130 in. 15.25; 132 in. 15.50; 134 in. 15.75; 136 in. 16.00; 138 in. 16.25; 140 in. 16.50; 142 in. 16.75; 144 in. 17.00; 146 in. 17.25; 148 in. 17.50; 150 in. 17.75; 152 in. 18.00; 154 in. 18.25; 156 in. 18.50; 158 in. 18.75; 160 in. 19.00; 162 in. 19.25; 164 in. 19.50; 166 in. 19.75; 168 in. 20.00; 170 in. 20.25; 172 in. 20.50; 174 in. 20.75; 176 in. 21.00; 178 in. 21.25; 180 in. 21.50; 182 in. 21.75; 184 in. 22.00; 186 in. 22.25; 188 in. 22.50; 190 in. 22.75; 192 in. 23.00; 194 in. 23.25; 196 in. 23.50; 198 in. 23.75; 200 in. 24.00; 202 in. 24.25; 204 in. 24.50; 206 in. 24.75; 208 in. 25.00; 210 in. 25.25; 212 in. 25.50; 214 in. 25.75; 216 in. 26.00; 218 in. 26.25; 220 in. 26.50; 222 in. 26.75; 224 in. 27.00; 226 in. 27.25; 228 in. 27.50; 230 in. 27.75; 232 in. 28.00; 234 in. 28.25; 236 in. 28.50; 238 in. 28.75; 240 in. 29.00; 242 in. 29.25; 244 in. 29.50; 246 in. 29.75; 248 in. 30.00; 250 in. 30.25; 252 in. 30.50; 254 in. 30.75; 256 in. 31.00; 258 in. 31.25; 260 in. 31.50; 262 in. 31.75; 264 in. 32.00; 266 in. 32.25; 268 in. 32.50; 270 in. 32.75; 272 in. 33.00; 274 in. 33.25; 276 in. 33.50; 278 in. 33.75; 280 in. 34.00; 282 in. 34.25; 284 in. 34.50; 286 in. 34.75; 288 in. 35.00; 290 in. 35.25; 292 in. 35.50; 294 in. 35.75; 296 in. 36.00; 298 in. 36.25; 300 in. 36.50; 302 in. 36.75; 304 in. 37.00; 306 in. 37.25; 308 in. 37.50; 310 in. 37.75; 312 in. 38.00; 314 in. 38.25; 316 in. 38.50; 318 in. 38.75; 320 in. 39.00; 322 in. 39.25; 324 in. 39.50; 326 in. 39.75; 328 in. 40.00; 330 in. 40.25; 332 in. 40.50; 334 in. 40.75; 336 in. 41.00; 338 in. 41.25; 340 in. 41.50; 342 in. 41.75; 344 in. 42.00; 346 in. 42.25; 348 in. 42.50; 350 in. 42.75; 352 in. 43.00; 354 in. 43.25; 356 in. 43.50; 358 in. 43.75; 360 in. 44.00; 362 in. 44.25; 364 in. 44.50; 366 in. 44.75; 368 in. 45.00; 370 in. 45.25; 372 in. 45.50; 374 in. 45.75; 376 in. 46.00; 378 in. 46.25; 380 in. 46.50; 382 in. 46.75; 384 in. 47.00; 386 in. 47.25; 388 in. 47.50; 390 in. 47.75; 392 in. 48.00; 394 in. 48.25; 396 in. 48.50; 398 in. 48.75; 400 in. 49.00; 402 in. 49.25; 404 in. 49.50; 406 in. 49.75; 408 in. 50.00; 410 in. 50.25; 412 in. 50.50; 414 in. 50.75; 416 in. 51.00; 418 in. 51.25; 420 in. 51.50; 422 in. 51.75; 424 in. 52.00; 426 in. 52.25; 428 in. 52.50; 430 in. 52.75; 432 in. 53.00; 434 in. 53.25; 436 in. 53.50; 438 in. 53.75; 440 in. 54.00; 442 in. 54.25; 444 in. 54.50; 446 in. 54.75; 448 in. 55.00; 450 in. 55.25; 452 in. 55.50; 454 in. 55.75; 456 in. 56.00; 458 in. 56.25; 460 in. 56.50; 462 in. 56.75; 464 in. 57.00; 466 in. 57.25; 468 in. 57.50; 470 in. 57.75; 472 in. 58.00; 474 in. 58.25; 476 in. 58.50; 478 in. 58.75; 480 in. 59.00; 482 in. 59.25; 484 in. 59.50; 486 in. 59.75; 488 in. 60.00; 490 in. 60.25; 492 in. 60.50; 494 in. 60.75; 496 in. 61.00; 498 in. 61.25; 500 in. 61.50; 502 in. 61.75; 504 in. 62.00; 506 in. 62.25; 508 in. 62.50; 510 in. 62.75; 512 in. 63.00; 514 in. 63.25; 516 in. 63.50; 518 in. 63.75; 520 in. 64.00; 522 in. 64.25; 524 in. 64.50; 526 in. 64.75; 528 in. 65.00; 530 in. 65.25; 532 in. 65.50; 534 in. 65.75; 536 in. 66.00; 538 in. 66.25; 540 in. 66.50; 542 in. 66.75; 544 in. 67.00; 546 in. 67.25; 548 in. 67.50; 550 in. 67.75; 552 in. 68.00; 554 in. 68.25; 556 in. 68.50; 558 in. 68.75; 560 in. 69.00; 562 in. 69.25; 564 in. 69.50; 566 in. 69.75; 568 in. 70.00; 570 in. 70.25; 572 in. 70.50; 574 in. 70.75; 576 in. 71.00; 578 in. 71.25; 580 in. 71.50; 582 in. 71.75; 584 in. 72.00; 586 in. 72.25; 588 in. 72.50; 590 in. 72.75; 592 in. 73.00; 594 in. 73.25; 596 in. 73.50; 598 in. 73.75; 600 in. 74.00; 602 in. 74.25; 604 in. 74.50; 606 in. 74.75; 608 in. 75.00; 610 in. 75.25; 612 in. 75.50; 614 in. 75.75; 616 in. 76.00; 618 in. 76.25; 620 in. 76.50; 622 in. 76.75; 624 in. 77.00; 626 in. 77.25; 628 in. 77.50; 630 in. 77.75; 632 in. 78.00; 634 in. 78.25; 636 in. 78.50; 638 in. 78.75; 640 in. 79.00; 642 in. 79.25; 644 in. 79.50; 646 in. 79.75; 648 in. 80.00; 650 in. 80.25; 652 in. 80.50; 654 in. 80.75; 656 in. 81.00; 658 in. 81.25; 660 in. 81.50; 662 in. 81.75; 664 in. 82.00; 666 in. 82.25; 668 in. 82.50; 670 in. 82.75; 672 in. 83.00; 674 in. 83.25; 676 in. 83.50; 678 in. 83.75; 680 in. 84.00; 682 in. 84.25; 684 in. 84.50; 686 in. 84.75; 688 in. 85.00; 690 in. 85.25; 692 in. 85.50; 694 in. 85.75; 696 in. 86.00; 698 in. 86.25; 700 in. 86.50; 702 in. 86.75; 704 in. 87.00; 706 in. 87.25; 708 in. 87.50; 710 in. 87.75; 712 in. 88.00; 714 in. 88.25; 716 in. 88.50; 718 in. 88.75; 720 in. 89.00; 722 in. 89.25; 724 in. 89.50; 726 in. 89.75; 728 in. 90.00; 730 in. 90.25; 732 in. 90.50; 734 in. 90.75; 736 in. 91.00; 738 in. 91.25; 740 in. 91.50; 742 in. 91.75; 744 in. 92.00; 746 in. 92.25; 748 in. 92.50; 750 in. 92.75; 752 in. 93.00; 754 in. 93.25; 756 in. 93.50; 758 in. 93.75; 760 in. 94.00; 762 in. 94.25; 764 in. 94.50; 766 in. 94.75; 768 in. 95.00; 770 in. 95.25; 772 in. 95.50; 774 in. 95.75; 776 in. 96.00; 778 in. 96.25; 780 in. 96.50; 782 in. 96.75; 784 in. 97.00; 786 in. 97.25; 788 in. 97.50; 790 in. 97.75; 792 in. 98.00; 794 in. 98.25; 796 in. 98.50; 798 in. 98.75; 800 in. 99.00; 802 in. 99.25; 804 in. 99.50; 806 in. 99.75; 808 in. 100.00; 810 in. 100.25; 812 in. 100.50; 814 in. 100.75; 816 in. 101.00; 818 in. 101.25; 820 in. 101.50; 822 in. 101.75; 824 in. 102.00; 826 in. 102.25; 828 in. 102.50; 830 in. 102.75; 832 in. 103.00; 834 in. 103.25; 836 in. 103.50; 838 in. 103.75; 840 in. 104.00; 842 in. 104.25; 844 in. 104.50; 846 in. 104.75; 848 in. 105.00; 850 in. 105.25; 852 in. 105.50; 854 in. 105.75; 856 in. 106.00; 858 in. 106.25; 860 in. 106.50; 862 in. 106.75; 864 in. 107.00; 866 in. 107.25; 868 in. 107.50; 870 in. 107.75; 872 in. 108.00; 874 in. 108.25; 876 in. 108.50; 878 in. 108.75; 880 in. 109.00; 882 in. 109.25; 884 in. 109.50; 886 in. 109.75; 888 in. 110.00; 890 in. 110.25; 892 in. 110.50; 894 in. 110.75; 896 in. 111.00; 898 in. 111.25; 900 in. 111.50; 902 in. 111.75; 904 in. 112.00; 906 in. 112.25; 908 in. 112.50; 910 in. 112.75; 912 in. 113.00; 914 in. 113.25; 916 in. 113.50; 918 in. 113.75; 920 in. 114.00; 922 in. 114.25; 924 in. 114.50; 926 in. 114.75; 928 in. 115.00; 930 in. 115.25; 932 in. 115.50; 934 in. 115.75; 936 in. 116.00; 938 in. 116.25; 940 in. 116.50; 942 in. 116.75; 944 in. 117.00; 946 in. 117.25; 948 in. 117.50; 950 in. 117.75; 952 in. 118.00; 954 in. 118.25; 956 in. 118.50; 958 in. 118.75; 960 in. 119.00; 962 in. 119.25; 964 in. 119.50; 966 in. 119.75; 968 in. 120.00; 970 in. 120.25; 972 in. 120.50; 974 in. 120.75; 976 in. 121.00; 978 in. 121.25; 980 in. 121.50; 982 in. 121.75; 984 in. 122.00; 986 in. 122.25; 988 in. 122.50; 990 in. 122.75; 992 in. 123.00; 994 in. 123.25; 996 in. 123.50; 998 in. 123.75; 1000 in. 124.00; 1002 in. 124.25; 1004 in. 124.50; 1006 in. 124.75; 1008 in. 125.00; 1010 in. 125.25; 1012 in. 125.50; 1014 in. 125.75; 1016 in. 126.00; 1018 in. 126.25; 1020 in. 126.50; 1022 in. 126.75; 1024 in. 127.00; 1026 in. 127.25; 1028 in. 127.50; 1030 in. 127.75; 1032 in. 128.00; 1034 in. 128.25; 1036 in. 128.50; 1038 in. 128.75; 1040 in. 129.00; 1042 in. 129.25; 1044 in. 129.50; 1046 in. 129.75; 1048 in. 130.00; 1050 in. 130.25; 1052 in. 130.50; 1054 in. 130.75; 1056 in. 131.00; 1058 in. 131.25; 1060 in. 131.50; 1062 in. 131.75; 1064 in. 132.00; 1066 in. 132.25; 1068 in. 132.50; 1070 in. 132.75; 1072 in. 133.00; 1074 in. 133.25; 1076 in. 133.50; 1078 in. 133.75; 1080 in. 134.00; 1082 in. 134.25; 1084 in. 134.50; 1086 in. 134.75; 1088 in. 135.00; 1090 in. 135.25; 1092 in. 135.50; 1094 in. 135.75; 1096 in. 136.00; 1098 in. 136.25; 1100 in. 136.50; 1102 in. 136.75; 1104 in. 137.00; 1106 in. 137.25; 1108 in. 137.50; 1110 in. 137.75; 1112 in. 138.00; 1114 in. 138.25; 1116 in. 138.50; 1118 in. 138.75; 1120 in. 139.00; 1122 in. 139.25; 1124 in. 139.50; 1126 in. 139.75; 1128 in. 140.00; 1130 in. 140.25; 1132 in. 140.50; 1134 in. 140.75; 1136 in. 141.00; 1138 in. 141.25; 1140 in. 141.50; 1142 in. 141.75; 1144 in. 142.00; 1146 in. 142.25; 1148 in. 142.50; 1150 in. 142.75; 1152 in. 143.00; 1154 in. 143.25; 1156 in. 143.50; 1158 in. 143.75; 1160 in. 144.00; 1162 in. 144.25; 1164 in. 144.50; 1166 in. 144.75; 1168 in. 145.00; 1170 in. 145.25; 1172 in. 145.50; 1174 in. 145.75; 1176 in. 146.00; 1178 in. 146.25; 1180 in. 146.50; 1182 in. 146.75; 1184 in. 147.00; 1186 in. 147.25; 1188 in. 147.50; 1190 in. 147.75; 1192 in. 148.00; 1194 in. 148.25; 1196 in. 148.50; 1198 in. 148.75; 1200 in. 149.00; 1202 in. 149.25; 1204 in. 149.50; 1206 in. 149.75; 1208 in. 150.00; 1210 in. 150.25; 1212 in. 150.50; 1214 in. 150.75; 1216 in. 151.00; 1218 in. 151.25; 1220 in. 151.50; 1222 in. 151.75; 1224 in. 152.00; 1226 in. 152.25; 1228 in. 152.50; 1230 in. 152.75; 1232 in. 153.00; 1234 in. 153.25; 1236 in. 153.50; 1238 in. 153.75; 1240 in. 154.00; 1242 in. 154.25; 1244 in. 154.50; 1246 in. 154.75; 1248 in. 155.00; 1250 in. 155.25; 1252 in. 155.50; 1254 in. 155.75; 1256 in. 156.00; 1258 in. 156.25; 1260 in. 156.50; 1262 in. 156.75; 1264 in. 157.00; 1266 in. 157.25; 1268 in. 157.50; 1270 in. 157.75; 1272 in. 158.00; 1274 in. 158.25; 1276 in. 158.50; 1278 in. 158.75; 1280 in. 159.00; 1282 in. 159.25; 1284 in. 159.50; 1286 in. 159.75; 1288 in. 160.00; 1290 in. 160.25; 1292 in. 160.50; 1294 in. 160.75; 1296 in. 161.00; 1298 in. 161.25; 1300 in. 161.50; 1302 in. 161.75; 1304 in. 162.00; 1306 in. 162.25; 1308 in. 162.50; 1310 in. 162.75; 1312 in. 163.00; 1314 in. 163.25; 1316 in. 163.50; 1318 in. 163.75; 1320 in. 164.00; 1322 in. 164.25; 1324 in. 164.50; 1326 in. 164.75; 1328 in. 165.00; 1330 in. 165.25; 1332 in. 165.50; 1334 in. 165.75; 1336 in. 166.00; 1338 in. 166.25; 1340 in. 166.50; 1342 in. 166.75; 1344 in. 167.00; 1346 in. 167.25; 1348 in. 167.50; 1350 in. 167.75; 1352 in. 168.00; 1354 in. 168.25; 1356 in. 168.50; 1358 in. 168.75; 1360 in. 169.00; 1362 in. 169.25; 1364 in. 169.50; 1366 in. 169.75; 1368 in. 170.00; 1370 in. 170.25; 1372 in. 170.50; 1374 in. 170.75; 1376 in. 171.00; 1378 in. 171.25; 1380 in. 171.50; 1382 in. 171.75; 1384 in. 172.00; 1386 in. 172.25; 1388 in. 172.50; 1390 in. 172.75; 1392 in. 173.00; 1394 in. 173.25; 1396 in. 173.50; 1398 in. 173.75; 1400 in. 174.00; 1402 in. 174.25; 1404 in. 174.50; 1406 in. 174.75; 1408 in. 175.00; 1410 in. 175.25; 1412 in. 175.50; 1414 in. 175.75; 1416 in. 176.00; 1418 in. 176.25; 1420 in. 176.50; 1422 in. 176.75; 1424 in. 177.00; 1426 in. 177.25; 1428 in. 177.50; 1430 in. 177.75; 1432 in. 178.00; 1434 in. 178.25; 1436 in. 178.50; 1438 in. 178.75; 1440 in. 179.00; 1442 in. 179.25; 1444 in. 179.50; 1446 in. 179.75; 1448 in. 180.00; 1450 in. 180.25; 1452 in. 180.50; 1454 in. 180.75; 1456 in. 181.00; 1458 in. 181.25; 1460 in. 181.50; 1462 in. 181.75; 1464 in. 182.00; 1466 in. 182.25; 1468 in. 182.50; 1470 in. 182.75; 1472 in. 183.00; 1474 in. 183.25; 1476 in. 183.50; 1478 in. 183.75; 1480 in. 184.00; 1482 in. 184.25; 1484 in. 184.50; 1486 in. 184.75; 1488 in. 185.00; 1490 in. 185.25; 1492 in. 185.50; 1494 in. 185.75; 1496 in. 186.00; 1498 in. 186.25; 1500 in. 186.50; 1502 in. 186.75; 1504 in. 187.00; 1506 in. 187.25; 1508 in. 187.50; 1510 in. 187.75; 1512 in. 188.00; 1514 in. 188.25; 1516 in. 188.50; 1518 in. 188.75; 1520 in. 189.00; 1522 in. 189.25; 1524 in. 189.50; 1526 in. 189.75; 1528 in. 190.00; 1530 in. 190.25; 1532 in. 190.50; 1534 in. 190.75; 1536 in. 191.00; 1538 in. 191.25; 1540 in. 191.50; 1542 in. 191.75; 1544 in. 192.00; 1546 in. 192.25; 1548 in. 192.50; 1550 in. 192.75; 1552 in. 193.00; 1554 in. 193.25; 1556 in. 193.50; 1558 in. 193.75; 1560 in. 194.00; 1562 in. 194.25; 1564 in. 194.50; 1566 in. 194.75; 1568 in. 195.00; 1570 in. 195.25; 1572 in. 195.50; 1574 in. 195.75; 1576 in. 196.00; 1578 in. 196.25; 1580 in. 196.50; 1582 in. 196.75; 1584 in. 197.00; 1586 in. 197.25; 1588 in. 197.50; 1590 in. 197.75; 1592 in. 198.00; 1594 in. 198.25; 1596 in. 198.50; 1598 in. 198.75; 1600 in. 199.00; 1602 in. 199.25; 1604 in. 199.50; 1606 in. 199.75; 1608 in. 200.00; 1610 in. 200.25; 1612 in. 200.50; 1614 in. 200.75; 1616 in. 201.00; 1618 in. 201.25; 1620 in. 201.50; 1622 in. 201.75; 1624 in. 202.00; 1626 in. 202.25; 1628 in. 202.50; 1630 in. 202.75; 1632 in. 203.00; 1634 in. 203.25; 1636 in. 203.50; 1638 in. 203.75; 1640 in. 204.00; 1642 in. 204.25; 1644 in. 204.50; 1646 in. 204.75; 1648 in. 205.00; 1650 in. 205.25; 1652 in. 205.50; 1654 in. 205.75; 1656 in. 206.00; 1658 in. 206.25; 1660 in. 206.50; 1662 in. 206.75; 1664 in. 207.00; 1666 in. 207.25; 1668 in. 207.50; 1670 in. 207.75; 1672 in. 208.00; 1674 in. 208.25; 1676 in. 208.50; 1678 in. 208.75; 1680 in. 209.00; 1682 in. 209.25; 1684 in. 209.50; 1686 in. 209.75; 1688 in. 210.00; 1690 in. 210.25; 1692 in. 210.50; 1694 in. 210.75; 1696 in. 211.00; 1698 in. 211.25; 1700 in. 211.50; 1702 in. 211.75; 1704 in. 212.00; 1706 in. 212.25; 1708 in. 212.50; 1710 in. 212.75; 1712 in. 213.00; 1714 in. 213.25; 1716 in. 213.50; 1718 in. 213.75; 1720 in. 214.00; 1722 in. 214.25; 1724 in. 214.50; 1726 in. 214.75; 1728 in. 215.00; 1730 in. 215.25; 1732 in. 215.50; 1734 in. 215.75; 1736 in. 216.00; 1738 in. 216.25; 1740 in. 216.50; 1742 in. 216.75; 1744 in. 217.00; 1746 in. 217.25; 1748 in. 217.50; 1750 in. 217.75; 1752 in. 218.0	

CONTENTS.

	PAGE
Cost of Repairs to Naval Vessels.....	1
The New Town of Hegewisch.....	1
Improved Cut Nail Machine. Illustrated.....	1
British Swords and Bayonets.....	1
New Inventions.....	7
A Railway Through the Sahara.....	7
French Mineral Statistics for 1883.....	7
Basic Steel for Shipbuilding.....	7
Successful Business Enterprise.....	9
A New Radial Drilling Machine. Illustrated.....	9
The New Steamer Elder.....	9
Latest Legal Decisions.....	11
A New Style of Gun.....	11
Chimney Construction. Illustrated.....	13
"Sensible" Door-Knob Fastening. Illustrated.....	15
Industrial Items.....	17
Prescriptive Right to a Water-Power.....	17
Editorial:	
The Western Nail Pool.....	18
Peripatetic Iron Works.....	18
Our Exports of Gold.....	18
Wages in the Western Iron Trade.....	18
Quality Grades Instead of Brands in the Tin-Plate Trade.....	18
The Outlook for Tin Plates.....	18
The British Iron and Steel Institute.....	19
The Defects in Bessemer Steel Not the Fault of the Process.....	19
Foundry Hydraulics.....	19
The New England Nail Strike.....	19
Washington News.....	19
Prison Labor.....	21
The Monongahela Coal District. Illustrated.....	21
Marine Notes.....	21
Pullman Iron and Steel Company.....	21
The Semi-Centennial of the Pennsylvania Railroad.....	21
The Smith-Casson Heating and Puddling Furnaces.....	21
Trade Report:	
British Iron and Metal Markets.....	23
Trade and Finance.....	23
General Hardware.....	23
Iron.....	23
Transactions of the New York Metal Exchange.....	23
Philadelphia.....	25
Pittsburgh.....	25
Chicago.....	25
Chattanooga.....	25
Cincinnati.....	25
Baltimore.....	25
Louisville.....	25
St. Louis.....	25
Metals.....	25
Imports.....	25
Exports.....	25
Coal.....	25
Old Metals, Paper Stock, &c.....	25
Foreign Trade Movements.....	25
Our English Letter.....	25
New York Wholesale Metal Prices.....	25
Foreign.....	30
The Hammer Nail Puller. Illustrated.....	30
Panama Canal Troubles.....	30
Massive Steel Forgings.....	30
Hydraulic Machinery in Buenos Ayres.....	30
Condition of the Copper Trade.....	30
Scientific and Technical:	
India Ink.....	30
History of Thermometers.....	30
Measuring the Dilatation of Small Bodies.....	30
End of a Long Strike.....	30
The Iron Age Directory.....	31
New York Wholesale Hardware Prices.....	32
A New Wrench. Illustrated.....	37
Manitoba's Iron.....	37
The Wiles Spring Hinge. Illustrated.....	37
Cheney's Compound Anvil and Vise. Illustrated.....	37
Large Guns for the Government.....	37
The Diamond Sash Ventilator. Illustrated.....	37
Beaudry's Upright Power Hammer. Illustrated.....	37
Philadelphia and Pittsburgh Hardware and Metal Prices.....	47
Boston Hardware and Metal Prices.....	48

BOOKS FOR BUILDERS.

Every Man His Own Mechanic. 750 illustrations; 816 pages, large 8vo; bound in cloth . . . \$3

A complete and comprehensive guide to every description of constructive and decorative work, especially adapted to the amateur artisan and apprentice. Valuable for reference, to the carpenter and builder. In three parts: I. Household Carpentry and Joining. II. Ornamental and Constructive Carpentry. III. Household Building Art and Practice. Containing practical suggestions and directions as to tools and their uses, cabinet work, masonry, bricklaying, plastering, painting, paper hanging, plumbing, &c.

Barn Plans and Outbuildings. 235 pages, 5 by 7½ inches, 257 illustrations, cloth . . . \$1.50

This book contains a large amount of information on general farm barns, cattle barns and stables, sheep barns, poultry-houses, carriage-houses, icehouses, dairy-houses, smokehouses, granaries, birdhouses, &c., and should be in the hands of every carpenter who is ever called upon to plan or execute buildings of this character.

Modern Architectural Designs and Details. 10½ by 14 inches, 80 full-page lith. plates, cloth . . . \$10

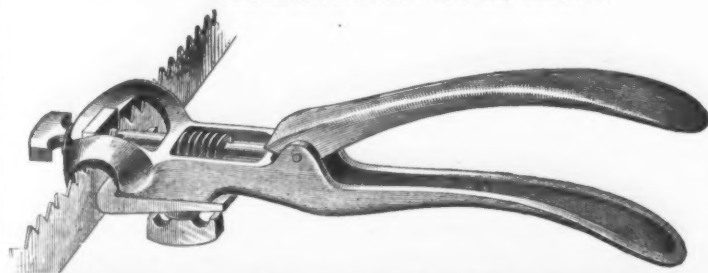
This work, which was published in parts during 1881, is the latest addition to the designs adapted for use among builders and architects, and is about the only volume which has given attention to the modern features of architecture which have appeared during the past few years. The drawings presented are from prominent architects of New York, Boston and other localities, and all the designs given are original in this work. Queen Anne, Eastlake, Elizabethan and other modernized styles are presented. A number of low-priced cottages, adapted to the requirements of the seaside and summer resorts, are included.

FOR SALE BY

DAVID WILLIAMS,
63 Reade Street, New York.

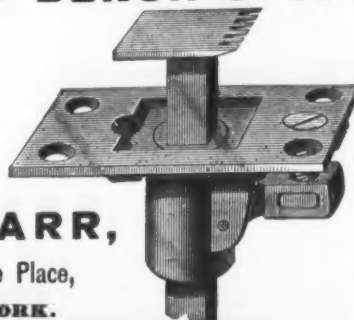
MORRILL'S PERFECT SAW SETS AND BENCH STOP.

FOR SETTING EVERY VARIETY OF SAWS.



For price lists
and discounts
Address

ASA FARR,
64 College Place,
NEW YORK.



JEFFERSON NAILS

JEFFERSON PIG IRON.

Forge and Foundry, JEFFERSON IRON WORKS.

Office and Works,

STEUBENVILLE, OHIO.

W. H. WALLACE, President.

C. B. DOTY, Vice-President.

GEO. P. HARDEN, Secretary.



COVERT'S PATENT HARNESS SNAPS,

Chain and Rope Goods, Adjustable Soldering Irons, &c.

These Goods are sold by all Leading Jobbers in General and Saddlery Hardware at manufacturers' prices. Send for Illustrated Catalogue and Price List.

COVERT MANFG. CO., West Troy, N. Y.



THE LONG & ALLSTATTER CO., Hamilton, Ohio,

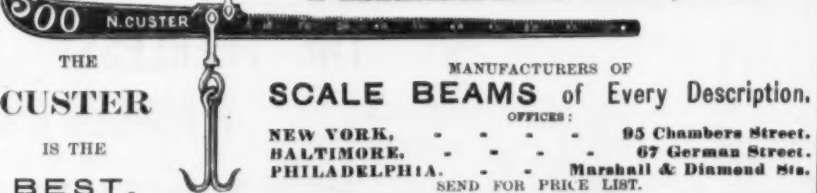
Cor. 4th and High Streets.

PUNCHES,
SHEARS,
AND
HAMMERS.

Double, Single, Horizontal, Twin Boiler, Spacing Gate, Multiple Angle, Bar, &c. Belt and Steam Driven

Send for Catalogue.

CUSTER BEAM WORKS, PHILADELPHIA, PA.



THE BEST GLUE IN THE WORLD FOR Pattern Making, EMERY BELTS, WHEELS, &c., &c. Send for Pamphlet.

LE PAGES LIQUID GLUE IN BOTTLES AND IN CANS. READY FOR USE. STRONGER, MORE CONVENIENT AND MORE ECONOMICAL THAN ANY OTHER GLUE SOLD EVERYWHERE ON ITS MERITS BY THE RUSSIA CEMENT CO. GLOUCESTER, MASS.

AWARDED THE GOLD MEDAL AT THE INTERNATIONAL EXHIBITION, London, 1883.

THE RENO BENCH VISE CO., Detroit, - - - Mich.,

MANUFACTURERS OF

THE RENO HAND SCREW

PATENT PENDING.



ADVANTAGES:

- 1st. It will outwear any wooden jaw hand screw with wood screws.
- 2d. It will not swell and refuse to work.
- 3d. It will not strip in the thread.
- 4th. It is not as cumbersome.
- 5th. It works easier and smoother.

Send for circulars and prices of different sizes.
C. O. LE COUNT & CO., New York,
GENERAL AGENTS.



TO GET THE BEST, Buy the Leonard Cleanable, with Movable Flues, Hardwood Carved Panels. Warranted First Class; Elegant and Durable.

MANUFACTURED BY THE
GRAND RAPIDS REFRIGERATOR CO.
Grand Rapids, Mich.
Send for Catalogue.

NEW AMERICAN FILE COMPANY,



NO EXTRA CHARGE MADE FOR THE TWO HANDLES IN BOX WITH EACH DOZEN FILES.
[Order a Few for Trial.]

PAWTUCKET, R. I., U. S. A.

PATENT OFFICE.

F. V. BRISEN,
82 and 84 Nassau Street,
NEW YORK.

AMERICAN AND FOREIGN PATENTS

Solicited promptly and at the lowest rates.

THE BABCOCK & WILCOX CO. WATER TUBE STEAM BOILERS,

107 Hope St. | 30 Cortlandt St. | NEW YORK
GLASGOW, | NEW YORK
BRANCH OFFICES:
BOSTON, 50 Oliver Street.
PHILA., 32 N. 5th Street.
PITTSBURGH, 98 4th Ave.
CHICAGO, 24 S. Canal St.
CINCINNATI, 6 W. 5th St.
ST. LOUIS, 707 Market St.
NEW ORLEANS, 54 Carondelet St.
SAN FRANCISCO, 551 Mission St.
HAYANA, 50 San Ignacio.
Send to nearest office for circular.



The F. F. ADAMS COMPANY, Erie, Pa.

THE LATEST THING OUT.

IDEAL MOUSE TRAP.

So perfectly simple in construction there is nothing to get out of order, as is the case with all other traps made on this principle. Guaranteed to give perfect satisfaction. Send for sample gross and you will not have any other trap that catches mice alive. The inventor of the Ideal invented all of the leading traps in the market to-day, and he says this one is perfection. Great care is taken in the manufacture of the Ideal, and every trap is perfect. A single trap for inspection will be sent by mail upon receipt of 5c. in stamps.



The Cyclone Mouse Trap.

We invite the attention of dealers to this "Novelty" in Mouse Traps. Patented Nov. 8, 1883, and now having an immense sale. It is cheap, durable and attractive, and so sensitive that the mouse who ventures to touch his nose to the bait box is doomed. Our salesmen on the road say it is the most popular trap ever offered to the trade. One of our men in a single short trip sold 5000. The retail price is only 10 cents each, and yet they afford big profits to the dealer. We will send a sample by mail, for inspection, upon receipt of five 2-cent stamps. Send for our Illustrated Catalogue.



JOHN SOMMER'S SON, 8, 10 & 12 Pearl Street NEWARK, N. J.,

Manufacturer of John Sommer's

WOODEN FAUCETS, Mallets and Variety Wood Turning.

All first quality faucets must be labeled. No goods genuine unless stamped "John Sommer's."



JOHN SOMMER'S BEST BLOCK TIN.

Cork Lined, first quality, warranted. Best Block Tin Key, Lignumvite Key, Rosewood, Red Cedar, Cherry and Butternut Faucets. John Sommer's Best Block Tin Key and First Quality Cork-lined Faucets are the best. Send for catalogue.

THE NEW GIANT DRILL CHUCK.

Holds a Drill With the Grip of a Giant. All Steel.



Parts interchangeable. SIMPLE IN CONSTRUCTION.

EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY CHEAP. Manufactured and sold by THE SMITH & EGGE MFG. CO. Bridgeport, Ct.

THE "SALEM" ELEVATOR BUCKET.

SHOVEL EDGE.
Seamless, Rounded
Corners.
CURVED HEEL.



RUNS EASY.
STRONG AND
DURABLE.
EMPTIES CLEAN.

W. J. CLARK & CO., Sole Manufacturers,
SALEM, OHIO.

NEW YORK OFFICE AND SALESROOM, NO. 9 CLIFF STREET.



The Celebrated Lightning Screw Plate.



WILEY & RUSSELL MFG. CO.,

MANUFACTURERS OF

Labor-Saving Machinery and Tools,

GREENFIELD, MASS.

SEND FOR PRICE LIST.

The Wm. D. Scott American Field Guns

LEAD THEM ALL.

Send for Price Lists, &c., to

JOHN W. HUTCHINSON,
81 CHAMBERS STREET, NEW YORK.

Wholesale Dealers Only in

GUNS, REVOLVERS, AMMUNITION, &c.

ASHLEY & REMINGTON,

Manufacturers' Agents and Iron Brokers.

All Kinds of Manufactured Iron

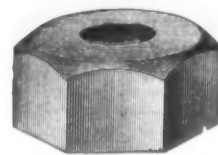
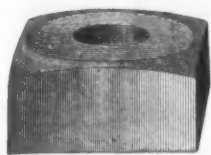
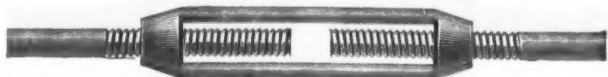
OLD RAILS AND RAILROAD SCRAP BOUGHT AND SOLD.

Correspondence solicited.

Office, 130 W. Sixth St., Kansas City, Mo.

FREDERICK A. KING, President.

WILLIAM B. DART, Treasurer.



RHODE ISLAND TOOL COMPANY,

SUCCESSORS TO
PROVIDENCE TOOL COMPANY.

Cold-Punched Square & Hexagon Nuts

(CHAMFERED AND TRIMMED, WITH DRILLED HOLES).

Finished Case-Hardened Nuts.

Drop-Forged Turn Buckles, Clinch Rings, &c.

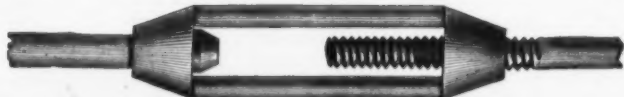
Sail Makers' and Ship Chandlery Hardware.

Norcross Iron Blocks.

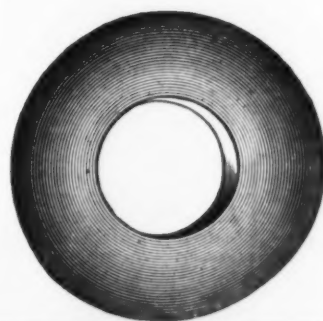
Drop Forgings of Iron or Steel Made to Order.

PROVIDENCE, RHODE ISLAND.

CATALOGUES MAILED



ON APPLICATION.



THE

ATTWELL BURGLAR-PROOF SASH LOCK & VENTILATOR

PERFECT IN PRINCIPLE!

NOVEL IN INVENTION!

WONDERFUL IN IMPROVEMENT!

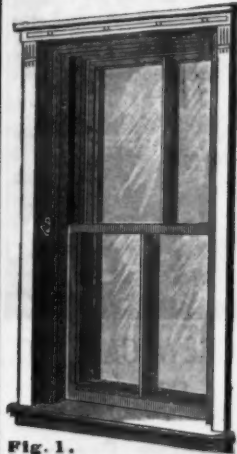


Fig. 1.—Interior view of window with ATTWELL LOCK applied, the key-head and escutcheon being alone visible.

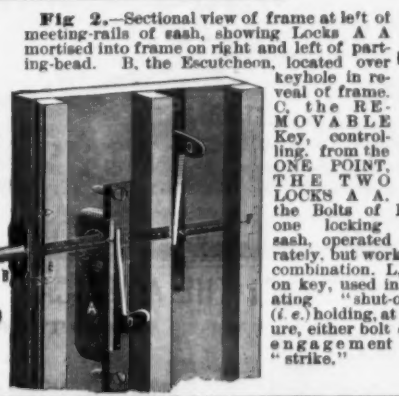


Fig. 2.



Fig. 3.

Fig. 3.—Section of sash showing location and application of "strike." This "strike" gives four locking or ventilating points to each sash within a radius of safety from the admission of the thief's body.

The Keys, Bolts, and Strikes, are all made of best Malleable Iron.

As may be seen, these Locks are so located and constructed that the thief cannot control or force them, and are especially convenient to the user. You can ventilate, and by removing key, securely lock at the same time. The sashes are automatically locked, dispensing with all care and labor of closing, and avoiding the possibility of an omission to lock. An ideal sash lock to every window, and where weights are not used, lends all needed power for holding and controlling either sash, or both, for purposes of ventilation! They are simple in construction, easily applied, adapted to all windows, thoroughly practical in mechanical detail, and are truly possessed of every attribute and novel power claimed for them. The Locks are finished in Tucker, Nickel and Bronze; retail at 25 cents, 37½ cents and 50 cents per window; come neatly packed (hardware complete for one window, with screws, in single box), and advertising matter, together with a perfect working model (same as Fig. 1), is supplied gratuitously to the dealer. Sample Locks, Nickel finish, in section (same as Fig. 2) showing application and operation, forwarded to any address on receipt of 50 cents. Circulars, Price List and Discounts, forwarded on application. Respectfully, &c.,

THE ATTWELL MFG. CO.,
Principal Office: 357 Race Street,
CINCINNATI, OHIO, U. S. A.

POPE & STEVENS
MANUFACTURERS OF
DOG COLLARS
ROLLERSKATES
& LEATHER GOODS.
114 CHAMBERS ST.
NEW YORK.
514 COMMERCE ST. PHILADELPHIA PA.

A. F. PIKE MFG. CO.,
Pike Station, New Hampshire, U. S. A.
Cable Address, "Pike, Haverhill."
MANUFACTURERS AND WHOLESALE DEALERS IN
BLUE STONE.
The Largest Manufacturers and Dealers in Stones for Sharpening all Edge Tools.
Pike's celebrated Blue Stone, Indian Pond (Red End), Lamotte, Black Diamond, Magic Green Mountain. All kinds branded with our name are genuine.
Also, Oil, Water and Dry Whetstones; Arkansas, Washita, Turkey, Hindostan and Sandstone; Razor Hones, Vienna Clear-shape.
In fact, everything that is used for sharpening Edge Tools supplied in any grit or shape required. Quality and Prices guaranteed. Send in your orders.
PIKE
AGENTS IN ALL FOREIGN COUNTRIES.

SELF-LUBRICATING PULLEYS AND HANGERS.

REED'S PATENT.

These pulleys and hangers have the pin hollow and filled with tallow, which melts with friction and furnishes perfect lubrication. The Hangers have Steel Arm. Wood Bushing, and are noiseless, self-lubricating and durable.

THE BEST AND THE CHEAPEST.

Address for Description, Circulars and Prices,

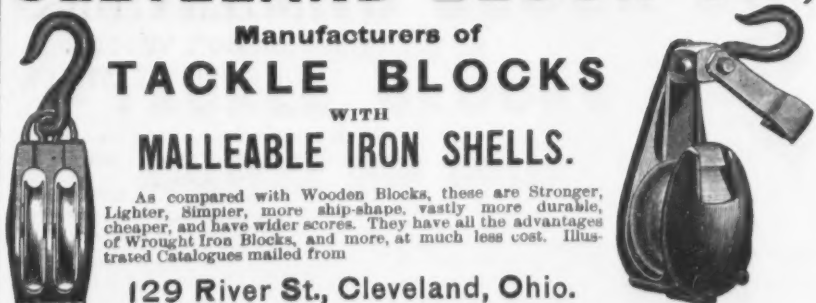
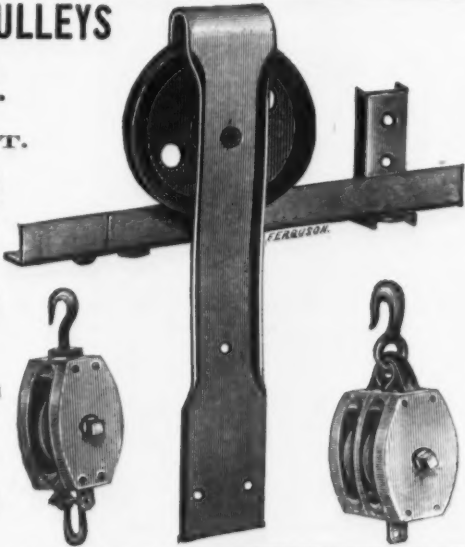
REED MFG. CO.,
CANAJOHARIE, N. Y.

CLEVELAND BLOCK CO.,

Manufacturers of
TACKLE BLOCKS
WITH
MALLEABLE IRON SHELLS.

As compared with Wooden Blocks, these are Stronger, Lighter, Simpler, more ship-shape, vastly more durable, cheaper, and have wider scores. They have all the advantages of Wrought Iron Blocks, and more, at much less cost. Illustrated Catalogues mailed from

129 River St., Cleveland, Ohio.



CHICAGO FORGING CO.,

No. 14 Metropolitan Block,
CHICAGO, ILL.

ANSON STAGER,
President,
W. H. SWIFT,
Vice-President,
E. L. BROWN,
Treas. & Gen. Man.
F. J. CUSHING,
Secretary.

DROP FORGINGS
IRON AND STEEL
OF EVERY DESCRIPTION
For Fire Arms, Saw and Wind Mills, Engine, Tool and Machine parts of all kinds, Railroad and Marine Work, Agricultural Implements and Machinery, Carriage and Wagon Irons, Electrical and other Apparatus.
Orders for Forgings in Iron or Steel required to be duplicated in large numbers, or which may be too small, intricate or expensive to be made by hand on the anvil, are especially solicited. Estimates furnished upon receipt of sample or patterns of forgings required.

HOWSON'S PATENT OFFICES

119 South Fourth Street,
PHILADELPHIA
Branch Office, 605 Seventh St. Washington, D. C.
M. HOWSON, Engineer and Surveyor; Patent.
G. HOWSON, Attorney at Law and Counsel in Patent Cases.
SEND FOR CIRCULARS.

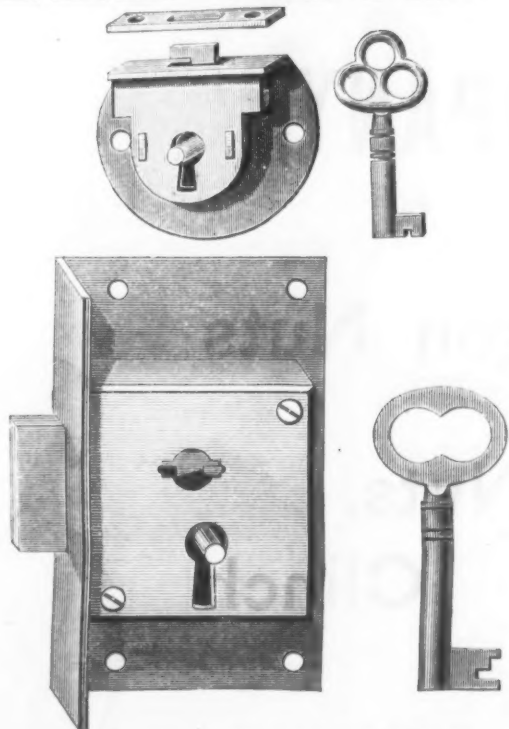
EUREKA SAP SPOUTS.

Sold by Hardware and Tin Dealers.
Samples and terms sent free to the Trade. Address all orders to
C. C. POST, Patentee, Burlington, Vt.

EAGLE LOCK CO.,

The Smith Patent Exhaust Fan, Forge and Pressure Blowers

Manufactories at Terryville, Conn., and Geneva, Ohio.



Noterom at No. 98 Chambers St., New York, U. S. A.

MANUFACTURERS OF THE LARGEST VARIETY OF
Cabinet, Trunk and Pad Locks
MADE BY ANY ONE CONCERN IN THE WORLD.
Illustrated Catalogue Mailed to the Trade Free upon Application.

ILLINOIS IRON & BOLT CO.,

Nos. 20 to 26 Main Street,
CARPENTERSVILLE, KANE CO., ILL.

MANUFACTURERS OF



Blacksmiths' Tools,

Thimble Skews,

LOCOMOTIVE JACK SCREWS

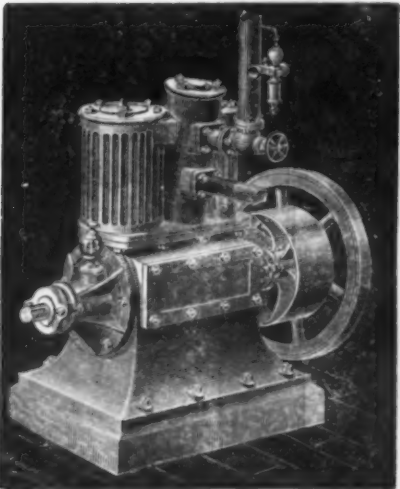
Track Jacks, Carriage Makers' Vises,
SAD IRONS, COPYING PRESSES AND STANDS, &c.

MACHINE TURNED WOOD HANDLES.

FOR MANUFACTURERS.
THIS IS OUR SPECIALTY, AND WE GUARANTEE THEM TO BE THE BEST
MADE IN THIS OR ANY OTHER COUNTRY.

Send samples for estimate to

JOINTA HANDLE WORKS.
GLENS FALLS, N. Y.



The best evidence of its peculiar merit is
the fact that our
Shipments Average Two Engines per day,
Over 600 Engines and 16,000 H. P. now in Operation.
OUR PRICES ARE MODERATE.
Send for Illustrated Circular and Reference List.
THE WESTINGHOUSE MACHINE CO.,
PITTSBURGH, PA.

Branch Offices: 101 Liberty street, New York.
14 South Canal street, Chicago.
201 Elm street, Dallas, Texas.
MILLER BROS. Trade Mark on Steel Pens,
Ink Erasers and Rocket
Cutlery. Superior quality.
Largest makers of Fine Crucible Steel Goods in the country.
STEEL PENS with style and action suited to every hand.
Full assortment of Pens mailed on receipt of 25 cents.
\$2.00 per gross, \$1.00 per quarter gross, \$0.50 per dozen.
Sold by all dealers. Price Lists furnished on application.
The Miller Bros. Cutlery Co., Meriden, Ct.

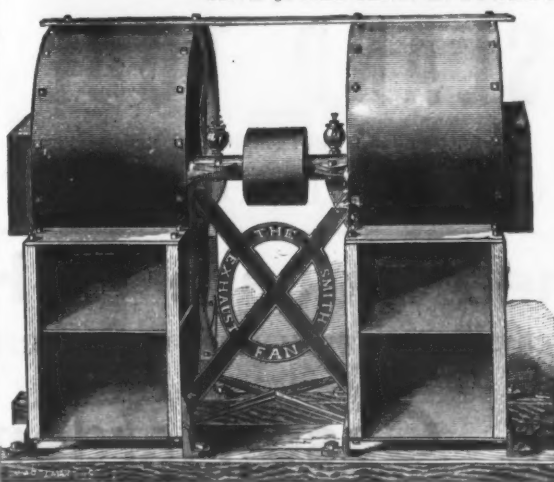
COOPER & McKEE,



MANUFACTURERS OF
REFRIGERATORS,
Hard or Soft Woods.
115 TO 119 GWINNETT STREET,
BROOKLYN, N. Y.

Catalogues Mailed on Application.
BONE GRINDING MILLS
AND
FARM FEED
MILLS.
Grinds wet,
green, greasy or
dry bones.
Prices for Hand use, from \$5 to \$15. For Power use,
from \$25 to \$50. Illustrated circulars and testimonials
on application.
WILSON BROS., Easton, Pa., U. S. A.
A discount to the Trade only.

SAVE 50 PER CENT. IN POWER APPLIED, AS COMPARED WITH OTHER MAKES.



DOUBLE EXHAUST FAN.

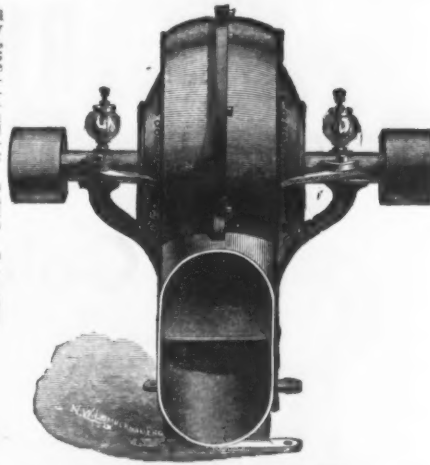
The Fans are specially adapted
for removing dust from Emery
and other Polishing Wheels,
Grindstones and Cleaning Mills;
Smoke and Gas from Machine
Shops, Steam from Dyeing Es-
tablishments, Ventilating Build-
ings, Tunnels and Mines; re-
moving Bark and Dust from
Mills in Tanneries, Shavings and
Dust from Planing Mill Machin-
ery and other Wood-Working
Establishments.

Cupola and Pressure Blowers
are especially adapted to Cupola
Furnaces and Forges, and all
places where a strong blast is
required.

Every machine tested before
shipping, and fully warranted.

HUYETT & SMITH
MFG. CO.,
No. 1400 Russell St.,
DETROIT, MICHIGAN.

Send for Catalogue and Prices.



CUPOLA AND FORGE BLOWER.

THE MENEELY HARDWARE CO.,

WEST TROY, N. Y.,
MANUFACTURE

HORSE AND CATTLE ROPE GOODS,

ROPE CLAMP SAFETY SNAP AND ADJUSTABLE ROPE BUCKLE.

PAT. IMPROVED GERMAN SNAP.



(Cut No. 2.)



(Cut No. 1.)

including Cattle Ties (connection of which is shown by Cut 1), Horse Ties, Web Halters, Rope Halters, Rope
Driving Reins, Halter Leads, Weight Cords, &c., &c., made up with valuable newly-patented fixtures, among
which are the Rope Clamp (doing away with clumsy double-thick splice), Adjustable Rope Buckle (a secure and
simple device), Halter Head-piece Clamp (holding head-rope constantly in position), Web Clamp, &c.; also, a
complete line of

HARNESS SNAPS,

the Improved German Snap (Cut No. 2), with guard, preventing ring working beneath the tongue; the Safety
Snap, from which the ring cannot twist out, and the Link Snap, the only perfect chain adjusting and repairing
Snap in the market.

For Sale by all Leading Dealers at Factory Prices.

Illustrated Catalogue Sent upon Application.

HORACE F. SISE, Agent, 100 Chambers St., NEW YORK.

PATENTED ARTICLES OF MALLEABLE IRON:

Hammer's M. I. Hanging Lamps.



Hammer's Adjustable Clamps.
Hammer's Malleable Iron Ollers, 3 sizes.
Hammer's M. I. Hand Lamps.
Hammer's M. I. pattern Heavy Screw Clamps: strongest
in the market.
NEW

For Sale by all the principal Hardware Dealers.
Send for price list.

Malleable Iron Castings of superior quality
and Hardware Specialties in Malleable
Iron made to order.

HAMMER & CO.,
Branford, Conn.

THE BOLTON STEEL CO.,

MANUFACTURERS OF

THE BEST REFINED

TOOL STEEL

AND OTHER FINE GRADES OF

CAST STEEL.

CANTON STEEL WORKS,

CANTON, OHIO.

Hugunin Patent Sash Fixtures.
Malleable Sash Balance, with and
without Locks (see cuts), also New
Sash Locks, for weights, locking
Sash open for ventilation; same
closed without handling locks.
Also Improved Screw Balances
(three sizes), malleable iron; the
1877 style—cast iron—sold at large
discount from former prices. Send
orders to **ROBT. B. HUGUNIN,**
Maker, Hartford, Conn. (Goods
delivered in N. Y. free of charge.)

YEOMANS & EADON, HIGHBRIDGE FORGE SHEFFIELD, (England.) MAKERS OF VERY BEST DOUBLE SHEAR STEEL SPECIALLY HAMMERED SQUARE DOUBLE SHEAR STEEL FOR TRIP HAMMER CUTLERY. OUR MAKE OF SHEAR STEEL IS SPECIALLY ADAPTED TO MEET THE REQUIREMENTS OF CUTLERY MANUFACTURERS.

THE AMERICAN BOLT & SCREW CASE CO., DAYTON, - - - OHIO, MANUFACTURERS OF

Patent Revolving Bolt and Screw Cases.

We are the only manufacturers of Bolt Cases and the only parties
who make lists of Bolt or Screw Cases to suit stock of purchaser without
extra charge.

COMBINATION BOLT AND SCREW CASES TO ORDER.
Sold by the leading Jobbing Hardware Dealers. Send for Illustrated
Circular. All Cases guaranteed.



Automatic Ejector Revolvers,
AND OTHERS.

AMERICAN ARMS CO. REVOLVERS.

Schoverling, Daly & Gales,
84 & 86 CHAMBERS ST., NEW YORK.

Wholesale Only. Send for Catalogue.

TENSILE STRAIN: 56,000 to 64,000 lbs.
REDUCTION OF AREA—35 to 43 per cent.

WM. McILVAIN & SONS,
MANUFACTURERS OF

BOILER PLATE

AND
CHARCOAL BLOOMS,

Locomotive, Fire Box, Flange and Shell
Iron; Plate for Bridges and Girders; Tank
and Stack Iron; Boat Plate and Iron for
Wrought Pipe; Plate Iron for Fire and
Burglar-Proof Safes.

Plates 1 1/4 inch thick to No. 14.
CAPACITY: 30 feet long,
70 inches wide.

A New Wrench.

Bowker & Tripp, New Bedford, Mass., have recently put on the market the wrench which is represented in the accompanying illustration, which gives a clear idea of its construction and the principles involved. It is intended to meet the demand for a wrench not only adapted to any size nut, but which will also grasp and hold the same in the



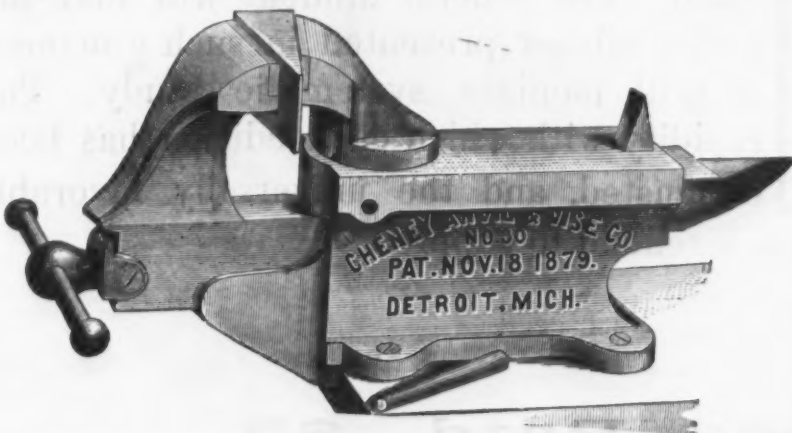
A New Wrench.

socket jaws, and when used as a carriage-wrench keep the nut clean from dirt and grit while oiling the axle, and again applying the nut to the axle without removal from the socket, thereby obviating the soiling of the hands in handling the nut. It is also intended for other uses, such as putting up shafting or other overhead work where a wrench is required. This wrench is spoken of as working satisfactorily, so far as it has been used by railroads, manufactories, foundries, mills and other establishments.

Bowker & Tripp also manufacture spinning lathes for spinning Britannia metals, shoe machinery, steam engines and the Dana centrifugal governor windmill. They report that their works are running actively on orders for their different products, and that the demand, especially for their wrenches, is widening.

Manitoba's Iron.—A company of St. Paul capitalists, namely, Messrs. F. C. Pillsbury, Albert C. Loring, Otis A. Gray, Charles Evans Holt, Robert T. Hurlburt and Robert C. Kalkhoff, says the *Montreal Herald*, will organize a \$2,000,000 company to develop the iron mines on Lake Winnipeg and erect a furnace at Selkirk, St. Boniface or Winnipeg for the purpose of smelting iron for the manufacture of steel, and to follow this up with rolling mills, locomotive works, mills for bar iron, steel works, foundries, nail works and other industries. They ask the Manitoba Government to give them a bonus on every ton of iron produced, and an additional bonus on every ton exported, the latter bonus to be withdrawn as soon as the home market would consume the products. They also ask that the Dominion Government admit all the plant and machinery for smelting purposes free of duty. It appears that nearly all the members of the Manitoba Assembly have signed the petition for the bonus.

A petition was recently presented to the Philadelphia Board of Education, urging it to take such steps as are necessary to secure industrial education in the public schools. The paper was signed by Burnham, Farry, Williams & Co.; William Sellers & Co.; William B. Bement & Son; William Wood & Co.; George V. Cresson; Enterprise Manufacturing Company, T. Henry Asbury, president; H. Belfield & Son; John & James Dobson; McCallum, Crease & Sloan; Thomas Dolan & Co.; John B. Stetson & Co.; Neafie & Levy; Henry Disston & Sons; C. & N.



Cheney's Compound Anvil and Vise

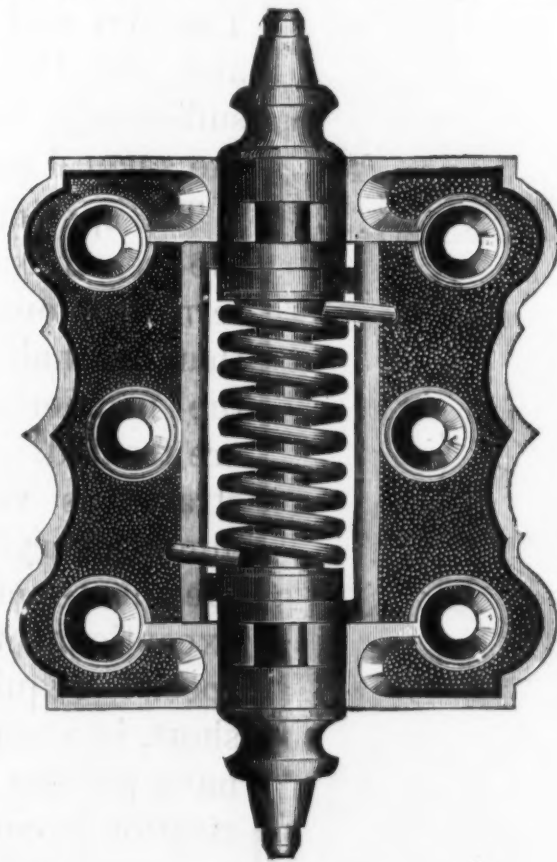
Thorpe & Co.; Thomas Wood; John S. Stevens, and Edwin H. Fittler & Co.

A Birmingham manufacturer, writing from Paris on the state of trade in France, says that those who deal in builders' ironmongery have been large sufferers through exceptionally heavy failures among speculative builders; and those who do a furnishing or fancy trade complain of a total lack of demand for their goods. Thousands of

clerks, shopmen and workpeople are without employment, and a general feeling of discontent is the result. His informants attribute the depression in a great measure to overproduction; but, compared with what it used to be, Paris seems absolutely lifeless, and other causes are certainly at work. Among employees an agitation is being made for participation in the profits of the businesses in which they are engaged; and employers, seeming to think that they will gain their end, appear to be disposed to meet them in the matter. An employers' association has been formed for taking this question into consideration. Prices are terribly low, and what demand there is for the cheapest class of goods.

The Wiles Spring Hinge.

The spring hinge illustrated in the engraving herewith does not differ materially at first sight from many other similar articles in the market with which our readers are generally familiar. The manufacturers, however—the Bartlett Hardware Company, of Freeport, Ill.—direct attention to features which indicate that it possesses far more than it would be judged to have on casual examination. They claim for it that it is the only spring hinge ever invented having its spring in the line of the pintle, and so constructed as to close the door until it is opened to a certain point, and when opened past that point to throw it open and hold it there. It is also a loose-pin hinge, permitting the instant removal of the door from the casing without turning a screw. It is also described as a spring hinge whose force is greatest when the door is closed, and whose force decreases gradually as the door is opened until it reaches the dead point, and increases as the door leaves the dead point, and until it is wide open, where it holds it



The Wiles Spring Hinge.

securely. The spring acts as a cushion or bumper when the door is fully open, and prevents it from striking the wall, and at the same time renders it impossible to break the hinge itself by any sudden jar as it is thrown back.

Cheney's Compound Anvil and Vise.

The Cheney Anvil and Vise Company, 115 Fort street, East Detroit, Mich., are manufacturing a combined anvil and vise with adjustable jaw that has several features to commend it for general use. The face of the anvil is chill-hardened and the jaws are steel-faced, thus adapting it for such rough use as occurs in repair shops, about farms and in various other places where a very fine tool is not required. A horn is presented on the end of the anvil which is used for various purposes, while a cutting edge is inserted at the back part of the plane surface, making it useful in various work of the character of amateur blacksmithing. This tool was de-

Large Guns for the Government.

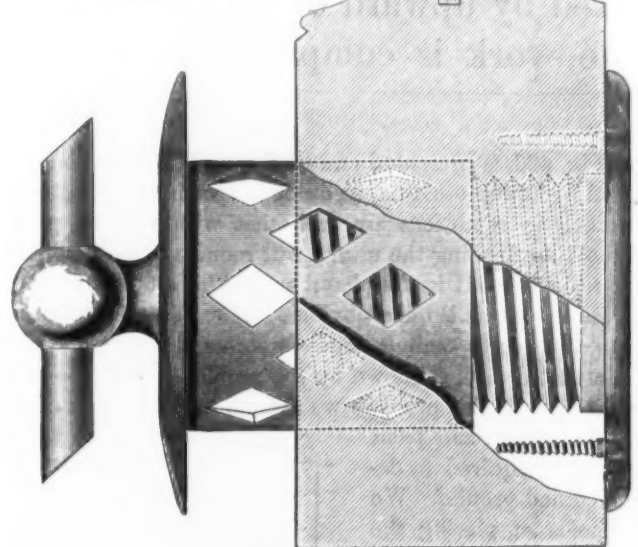
After seven years of idleness the larger furnace of the South Boston Iron Works was lighted up on March 1 for the casting of a 12-inch rifle mortar for the United States Ordnance Department. The last heavy gun previously cast in this country was in 1877, when a 12-inch rifle of some 50 tons weight was ordered from this establishment by the Government. When completed, it was taken to the Sandy Hook proving ground for firing, where it now remains in good condition, although it has been fired some 100 rounds, with charges as high as 200 pounds of powder and a projectile weighing 700 pounds.

Mr. W. P. Hunt, president of the South Boston Iron Works, in conversation with a reporter of the *Boston Traveller*, said: "The gun that has been cast was the first of a lot of five heavy experimental guns which were authorized by the last Congress and contracted for by the Ordnance Department in September last. Of these five guns, one was to be a 12-inch rifle mortar; another a 10-inch breech-loading rifle, the body to be of cast iron, which is to be reinforced by a wrapping of steel wire. The third is to be a 12-inch breech-loading rifle entirely of cast iron, and is to weigh, when finished, some 57 tons. The fourth is to be like the last in all respects, with the one exception that it is to be lined from the breech with a short steel tube, to reach a little beyond the trunnions. The fifth is to be a 12-inch breech-loading rifle, the body to be of cast iron, but to be reinforced by steel rings around the breech, and to be lined with a short steel tube, which, with the rings and other short steel tube referred to, are to be imported from England, as we have no facilities in this country for the fabrication of such steel forgings.

built very cheaply, and the labor of months could, with its aid, be accomplished in days. It would be a small affair compared with a Northern stump extractor, and would do more good to Florida than 1000 more miles of railroad. The first good, cheap, strong palmetto root extractor which shall be sent to Florida ought to win its maker a return in abundant money."

The Diamond Sash Ventilator.

A decided novelty in the way of a sash ventilator is presented in the engraving herewith, and is manufactured by the Diamond Ventilator Company, 130 Dearborn street, Chicago. In the form shown in the cut, and that in which our readers will be most particularly interested, it is applied to a window sash. The same features, however, are embodied in ventilators adapted for use in passenger, sleeping and refrigerator cars, and for various other purposes. The term "Diamond," used in describing this device, is derived from the shape of the openings through which the air is discharged into the room. The device consists essentially of two cylinders threaded and working together, as shown in the engraving. The outer end, which would be that to the right in our cut, is provided with a wire screen covering the opening, and through this the exterior air is drawn toward the room to be ventilated. The amount

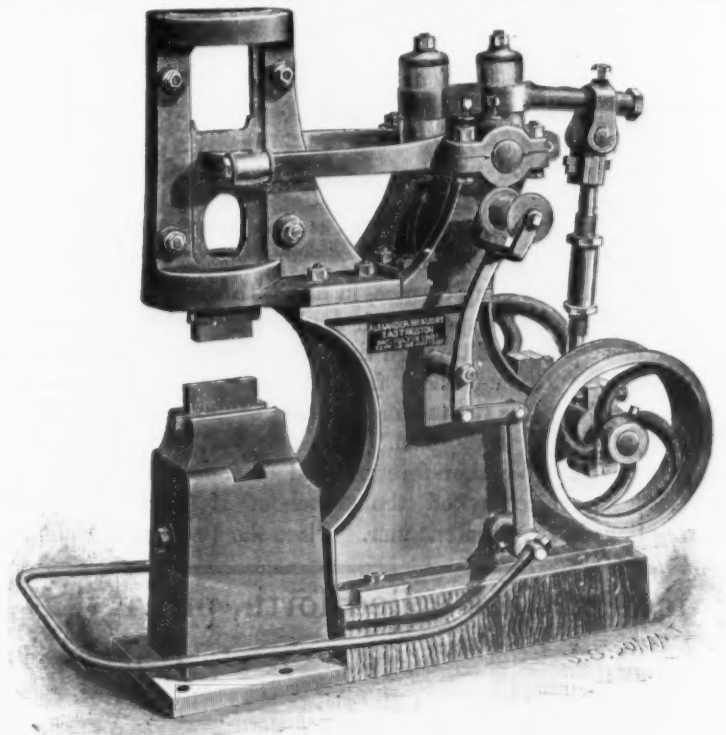


The Diamond Sash Ventilator.

of opening on the inside is controlled by the handle of the ventilator and the screw already alluded to. As shown in the engraving, it is in the position of about one-half capacity. By revolving the handle to the left the opening would be increased, while, on the other hand, by turning it to the right it would be shut. Our readers will perceive the advantage of a device of this kind, since it is easily applied in many places where otherwise no ventilation could be obtained. A number of these inserted in the window sash of a close office would supply the fresh air necessary to the comfort of the inmates, without subjecting any one to a draft or the danger of taking cold. An objection that might be raised is the smallness of the opening, and, consequently, the limited supply of fresh air to be obtained by it. By using the larger sizes, and a number of them, this difficulty is in the main overcome. Several sizes are made, adapting the device to various uses.

Beaudry's Upright Power Hammer.

The power hammer shown in the annexed engraving, and manufactured by Mr. Alexander Beaudry, 150 Portland street, Boston, Mass., is of an entirely new design, and em-

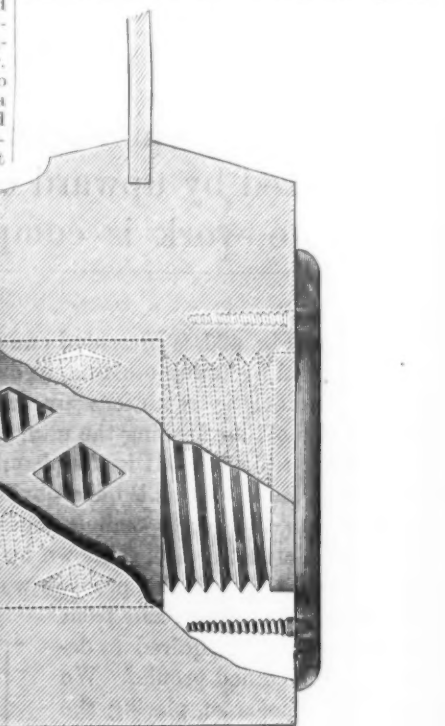


Beaudry's Upright Power Hammer.

bodies a number of interesting features well worth considering. The blow is a direct vertical blow, and can be so nicely graduated as to strike with a force of from 2 ounces to 600 pounds. The stroke can be changed from a short stroke to a long one by sliding the regulator back or forth. It does not vibrate, as the head is secured in vertical guides which are made in two pieces, with wood inserted between them, so that, if there should be any wear, the wood can be shaved down a little, which will take up the slack. The hammer is claimed to have

all the advantages which a steam hammer of its size, or perhaps larger, would have, including cutting and punching, &c., and, in addition, there are no pipes or cylinder to freeze in cold weather. At the same time it can be used without alteration for lighter work, such as tool, knife and implement making of every kind, and also for drop work.

No help is required to run it, as would be needed in the case of a steam hammer, the smith setting it in motion by simply pressing his foot on the treadle which extends around the bed, and he can do this equally well whether standing in front or on either side. The treadle is attached to a compound lever, on the end of which is a small tightening pulley, as shown in the cut. A brake on the other side of the hammer, attached to the compound lever shaft, stops the motion when the pressure is removed by pressing against the balance-wheel. The regulator on the horizontal lever to which the connecting-rod is attached can be moved back or forth in order to make a longer or shorter stroke. The force of the blow is regulated by the



pressure on the treadle. The hammer-head is slotted to receive the leather band which connects it with the two arms. It is made of rawhide, double thick, six-ply, rolled over and over and riveted together. On the end of each arm there is a brass bushing which prevents chafing. Four strong rubber springs, locked in with bolts, and uniting the horizontal lever with the pitman, also give great elasticity. The hammers are adapted to a large variety of forging, and are carefully tested before being delivered.

According to the recently-issued official statistics, 1275 miles of railway were built in Canada last year, making a total of 8805 miles under traffic. When the lines at present under construction are completed, which will be within two years, the railway system of Canada will comprise over 11,400 miles. The paid-up capital was increased to \$494,271,264, or 10 per cent. The gross revenue during the year was \$33,244,585, an increase in receipts over those of the preceding year of \$4,216,796.

When wheat fell to 77 cents a bushel at Chicago, a few days ago, many supposed that to be an unprecedented low price, but in

A new machine is called for by a correspondent in Florida, who says: "If any man wants a hint how to make a fortune, I will give him one. Thousands of acres of land are now in process of clearing in Florida. The chief labor of clearing is in removing the large horizontal roots of the dwarf palmetto. These are innumerable, crossing one another and clinging to the sand, along the top of which they run, with a multitude of strong, fibrous roots which descend into the soil. No one seems to have thought of a machine for extracting these roots. It could be

olden times that was thought to be a high price. During the year 1855 wheat sold in Chicago at 53 cents, in 1859 at 60 cents, in 1860 at 66 cents, in 1861 at 55 cents, and in 1862 at 65 cents. American wheat was sold at 96 cents a bushel in Liverpool last week, which is claimed to be considerably lower than the price at which Indian wheat can be laid down there, notwithstanding the moderate ocean freights charged by Indian wheat carriers which have been subsidized by the British Government in order to develop this trade.

THE METAL WORKER PATTERN BOOK.

BY A. O. KITTREDGE.

THIRD EDITION NOW READY.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 500 line engravings.

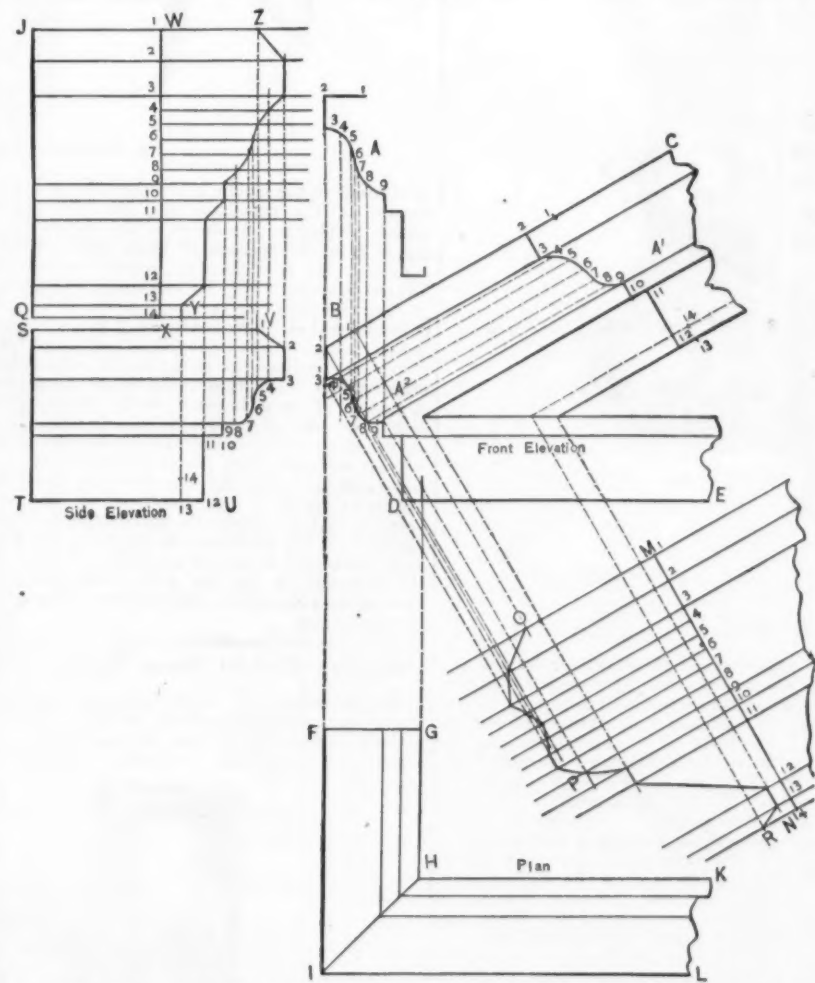
The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions

Pattern Problems.

161

G H K, of Fig. 426, is presented one of the sets of conditions which necessitate a change of profile, in either the horizontal or raking molding, in order to accomplish a miter joint at the point indicated by I H in the plan. In other words, the conditions are such that with a given profile, as shown by A' in the raking molding, the horizontal molding forming the return will require to be modified, as shown by the profile A'', in order to form a miter upon the line I H in the plan; or, if A' is established, A'' will have to be constructed to correspond with A'. The reason for this is quite obvious. The distance across the raking molding at right angles to its lines is greater than the corresponding distance across the return molding at right angles to its lines; therefore the projection in the cornice, as shown by the profile A'', must be distributed through a smaller space than is shown in the profile A'. In this problem we assume that the pitch of the raking cornice B C is established and that the profile A is given, and from these parts it is required to develop the modified profile. We have the choice of placing the normal profile in the horizontal return and making the raking profile correspond with it, or of placing the normal profile in the raking molding and making the profile of the horizontal molding agree with it. Although the principle upon which these operations is performed is identical in both, the demonstration will be made clearer if each is fully illustrated independent of the other. In this problem and the following one, therefore, we show the several steps necessary to take in modifying the profile, and in cutting the several patterns required to form the structure indicated by the elevation and plan. First we will assume that the normal profile occurs in the raking cornice, and that the horizontal profile is to be modified to suit it. We then proceed as follows: Draw a representation of the normal profile in the raking cornice, as shown by A', placing it to correspond to the lines of the cornice, as shown. Draw another profile corresponding to it in all parts, directly above or below the foot of the raking cornice, in line with the face of the new profile to be constructed, placing this profile A so that it shall correspond with the lines of the horizontal cornice. Divide the profiles A and A' into the same number of parts, and through the points thus obtained draw lines, those from A' being parallel to the lines of the raking cornice, and those from A intersecting them vertically. Through these points of intersection trace a line, which gives the modified profile, as shown by A''. Then A'' is the profile of the horizontal return, indicated by G H I F in the plan. It is also the elevation of the miter line I H of the plan for the several patterns involved. We therefore proceed as follows: At any convenient point at right angles to the lines of the raking cornice lay off the stretchout M N of the profile A', through the points in which draw measuring lines in the usual manner. Place the T-square at right angles to the lines of the raking cornice, and,

Fig. 426.—To Ascertain the Profile of a Horizontal Molding Adapted to Miter with a Given Inclined Molding at Right Angles in Plan, and the Several Miter Patterns Involved.



and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting; and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The specimen page here shown is from the last division of the book, entitled "Pattern Problems," and which embraces more than one-half of the entire work. It shows the manner in which practical questions are treated. The list of problems demonstrated is very extensive, and embraces almost everything of common occurrence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything, from a simple miter to the most complex problems, so arranged as to meet his requirements without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable

comments it has called forth, prove that it fully meets the want it was intended to supply.

Price, Post or Express Paid, \$5.

Address all orders to DAVID WILLIAMS, Publisher and Bookseller,

83 Reade Street, New York.

THE CUMMER ENGINE

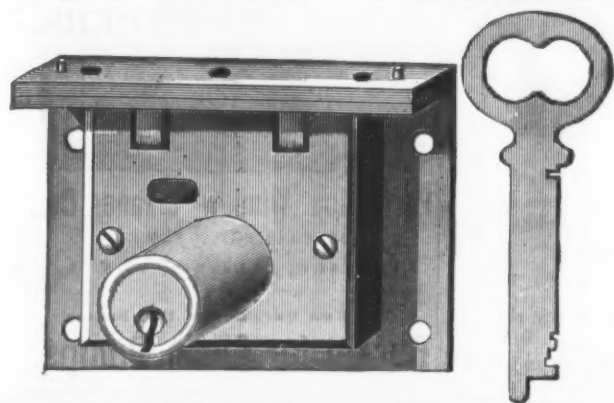
AWARDED THE GOLD MEDAL

at the CINCINNATI EXPOSITION, and a Special Prize for Extraordinary Merit. Also, the Highest Medal at Louisville for the Best Automatic Engine.

SEND FOR 150-PAGE CATALOGUE, No. 7.

THE CUMMER ENGINE CO., Cleveland Ohio.

THE CHARLES PARKER CO.,



MERIDEN,
CONN.,
Manufacturers of
CABINET
LOCKS.

Rocking Grate-Bar Co.,

45 FRANKLIN STREET,
CHICAGO.

The Southern White Lead Company, of St. Louis, preparatory to making a change in their Grates, very carefully investigated the merits of the Rocking Grate-Bar. Among others, they proposed the following questions to several of those who were already using our Grates:

- How long have you used the Rocking Grate-Bar?
- Do you use slack or lump coal, high or low grade?
- Do the Rocking Grate-Bars get out of order easily?
- Do clinkers or ashes get between the clips or on the bearings and interfere with their movement?
- Can the Bars be kept clean without the use of rakes?
- Do the clips burn or require to be replaced often?
- Is there improvement in the draught?
- Is there saving in fuel? If so, about how much?
- On the whole, do you consider the advantages justify the investment?

These questions were so satisfactorily answered by others who have them in use that the Company have placed their order with us for Rocking Grate-Bars, to go under four boilers, and they are now being fitted up.

Every one who has tested our Grate-Bars has been satisfied with their performance. Our customers are our references without an exception.

Write for Descriptive Circular and list of parties using these Grates.

We guarantee "the Best Fires from the Worst Coal, and absolutely no cleaning."

BRANCH OFFICES:

NEW YORK, 395 Canal Street,
ST. LOUIS, 702 S. Third Street.

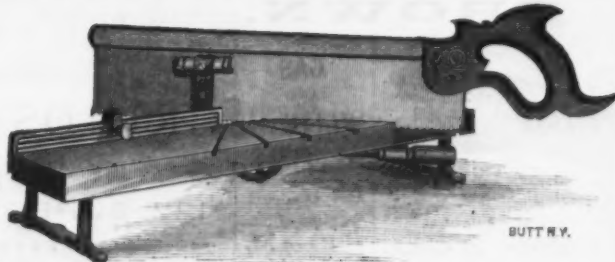
THE ROCKING GRATE-BAR CO.

45 Franklin Street, Chicago.

THE "ACME" Mitering Machine.

FLAGLER, FORSYTH & BRADLEY,
AGENTS,

298 Broadway, NEW YORK.



RIEHLÉ BROS. STANDARD SCALES

AND TESTING MACHINES

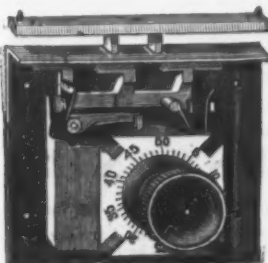
PHILADELPHIA,
50 South Fourth St.
NEW YORK,
115 Liberty Street.

Tests of Materials made daily at the Works, and certificates furnished. Reports copied and kept confidential.

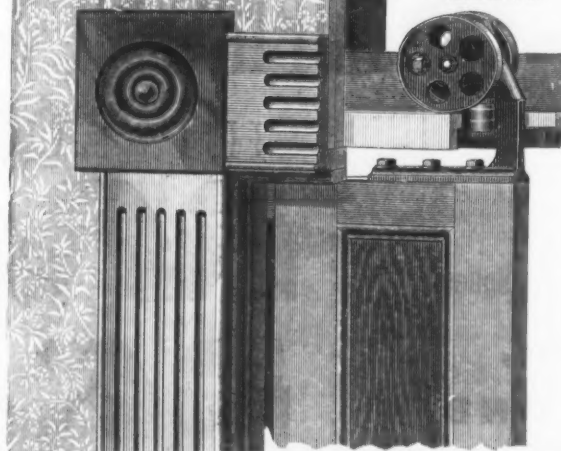
TAYLOR'S DUPLEX COMBINATION LOCKS.

The Cheapest and Best in the World. Send for Prices.
RETAIL FROM \$1.50 TO \$3.00. 2500 CHANGES.

FOR ALL PURPOSES.
TAYLOR MFG. CO.,
NEW BRITAIN, CONN.



THE "DAVIS" PARLOR DOOR HANGER



FOR SLIDING DOORS.

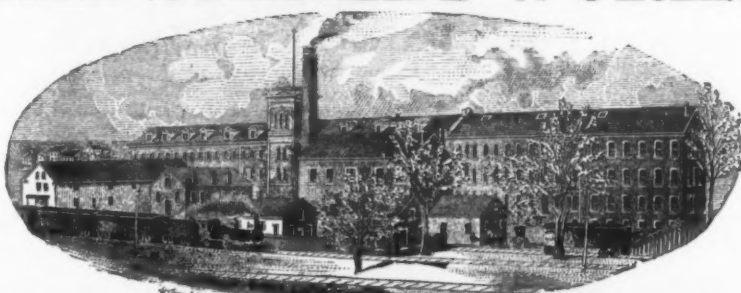
Easy to Hang or Adjust.

GUARANTEED THE Best Working Hanger ON THE MARKET.

Send for Circulars and Prices.

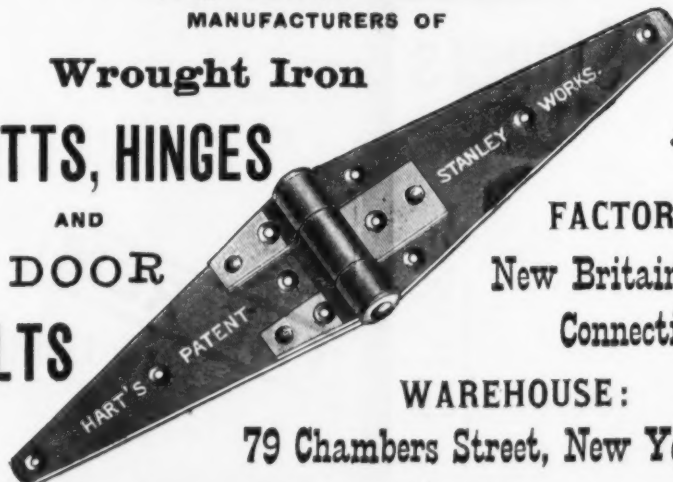
MANUFACTURED BY
SENECA MFG. CO.,
Seneca Falls, N. Y.,
AND THE
JAMES SMART MFG. CO.,
(LIMITED)
BROCKVILLE, CANADA.

THE STANLEY WORKS



MANUFACTURERS OF

Wrought Iron
BUTTS, HINGES
AND
DOOR
BOLTS



FACTORIES:
New Britain,
Connecticut.

WAREHOUSE:
79 Chambers Street, New York.

Goods furnished Plain, Galvanized, Japanned, Bronzed & Nickel Plated.

PERFORATED SHEET METALS



For Elevators, Malt Kiln Floors, Grain Dryers, Threshers, Separators, Corn Shellers and all kinds of Grain Cleaning Machinery; also for Mining and Concentrating Works, Coal, Coke and Ore Screens, Gas and Water Works, Paper, Woolen, Flour and Oil Mills, Filters, Strainers, Ventilators, etc. Special attention given to work for Railroads and Car Builders. PERFORATED TIN AND BRASS of all sizes. Iron, Steel, Copper, Brass and Zinc Punched to any size and thickness required. Stamp Battery Screens a Specialty. Correspondence solicited.

THE HARRINGTON & KING PERFORATING CO.,
Main Office and Works, Nos. 43 to 51 S. Jefferson St., CHICAGO.
Branch Office, 100 Beekman St., New York.

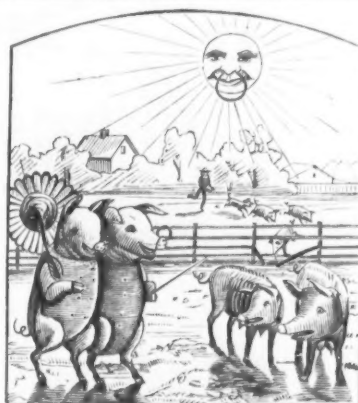
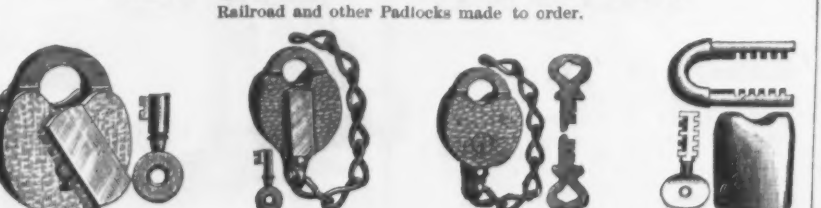
THE ASBESTOS PACKING CO.,



MINERS AND MANUFACTURERS OF
ASBESTOS.
Office, 169 Congress St., BOSTON.
Steam Packings,
Wick, Fiber,
Mill Board,
Flooring Felt
Cement Felting,
Pipe and Boiler Coverings,
Cloth, Yarns, &c.
BOLLING & LOWE,
2 LAWRENCE POUNTNEY HILL, LONDON, E. C.
General European Agents.

BRASS, MALL. IRON AND SCANDINAVIAN PADLOCKS,

Manufactured by TOWER & LYON, 96 Chambers St., New York.
BEST QUALITY. LARGE VARIETY.
Railroad and other Padlocks made to order.



BLAIR'S PATENT

Hog and Pig Ringers

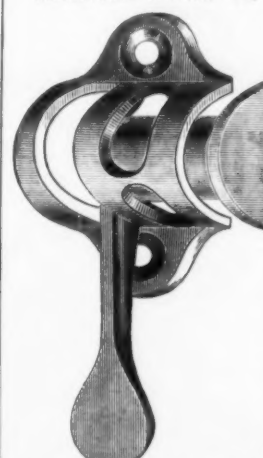
AND RINGS.

DAILY PRODUCTION OF RINGS, 75,000.
Parties buying and selling Ringers with two or more grooves in jaw, other than those labeled Blair's Patent, March 17, 1874, are infringing, and will be held responsible for damages.

E. BLAIR,
Bucyrus, Ohio.

The Common Sense Sash Holder and Lock Combined.

PATENTED MARCH 6th, 1883.



Is the best, cheap and most complete Sash Holder and Lock in the market, and we think has the largest sale. It holds the window at any point, and locks the same when down, and entirely prevents windows from rattling. I am the sole owner of this patent, and sole manufacturer of these fasteners, and all persons are hereby notified of this fact. Any parties infringing will be dealt with according to law. Parties who have been buying and selling the "Practical Fastener," so-called, will do well to heed the warning. Orders from the trade respectfully solicited.

Circular with price list mailed on application.

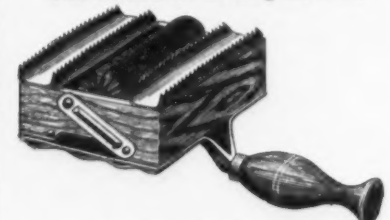
H. A. WILLES,

MANUFACTURER AND DEALER IN HARDWARE SPECIALTIES, AND OIL AND GAS STOVES,
727 Market Street, PHILADELPHIA, PA.



COMBINATION ROTARY BRUSH & CURRYCOMB,

With Pockets for Holding the Dust.



PATENT APPLIED FOR.

These Combs are manufactured of good material, strong and durable, and acknowledged by all horsemen that have given them a trial to be all they are represented.

RAY HUBBELL,

SOLE MANUFACTURER,
Send for Prices. Northville, N. Y.

THE FLAMMANG GRADED INJECTOR.

The Latest, Most Improved, Simplest, and Most Economical Boiler Feed. OPERATED ENTIRELY BY ONE HANDLE.

Will work as well with hot or cold water, and a perfect grading machine. Send for catalogue and prices to

FLAMMANG INJECTOR CO.,
44 Atwater Block,
CLEVELAND, O.

Dynamite, Nitro Glycerine, BLASTING MATERIALS.

Contracts Taken for Clearing Lands of Stumps.
ADDRESS
THE HERCULES POWDER COMPANY
Cincinnati, Ohio.



Issues Policies of Insurance after a careful inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of Steam Boilers.

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,
or at any agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. Pierce, Sec.

Board of Directors.

J. M. ALLEN, President.
LUCIUS J. HENDRE, President Aetna Fire Ins. Co.
FRANK W. CHENEY, of Cheney Bros. Silk Mfrs.
Hartford and New York
CHARLES M. BEACH, of Beach & Company.
DANIEL PHILLIPS, of Adams' Express Company.
GEO. M. HARTHOLMEW, President Holyoke Water
Power Company.
RICHARD W. H. JARVIS, President Colt's Pat. Fire
Arms Manufacturing Co.
THOMAS O. ENDERS, of the Aetna Life Insurance Co.
LEVERETT BRAINARD, of the Case, Lockwood &
Brainard Co.
GEN. WM. R. FRANKLIN, Vice-President Colt's Pat.
Fire Arms Mfg. Co.
GEO. CROMPTON, Crompton Loom Works Worcester,
Mass.
HON. THOMAS TALBOT, Ex-Governor of Massachu-
setts, Lowell.
NEWTON CASE, of the Case, Lockwood & Brainard Co.
WM. S. SLATER, Cotton Manufacturer, Providence.
NELSON HOLLISTER, of the State Bank, Hartford.
CHAS. T. PARRY, of Baldwin Locomotive Works,
Philadelphia.
HON. HENRY C. ROBINSON, Attorney at Law, Hart-
ford.

Enterprise Cherry Stoners



RAPID.

SIMPLE.

PRICE, \$7.50 PER DOZEN.

The above cut illustrates our new ENTERPRISE CHERRY STONER. It can be adjusted by thumb screws to adapt it to the different sizes of cherry stones. It will be found very rapid in its work, and a decided improvement over others of this class.

SEND FOR CATALOGUE.

ENTERPRISE MANUFACT'G CO., Philadelphia.

THE "AUTOMATIC" BLIND AWNING FIXTURE,

Attachable to Old as well as New Blinds on FRAME or BRICK Houses.

FOR SALE BY ALL THE HARDWARE TRADE.



MARKLEY, ALLING & CO.,
CHICAGO.

H. F. SISE, 100 Chambers St.,
NEW YORK WAREHOUSE.

The very best Blind Hinge and a perfect Awning Fixture. No cloth to tear and wear out. No iron frames to shake and rattle. Blinds instantly converted to Awnings. Awnings instantly converted to Blinds. No skilled labor necessary to apply them. A child can operate them. Indispensable for Summer Hotels and Dwellings. Rooms always cool and shady. Many thousands in successful operation. Models furnished to architects.

F. O. NORTH & CO., Manufacturer's,
BOSTON, MASS.

"Something New. Just Out."

RICHARD PATRICK, President. JOHN H. PATRICK, Sec. and Treas.
AMERICAN TOOL COMPANY,
116 CHAMBERS STREET, NEW YORK.

are now Manufacturing a Fine Line of
Housekeepers' Tool Chests,
FITTED UP COMPLETE WITH USEFUL TOOLS.

ALSO MACHINISTS' EMPTY TOOL CHESTS.

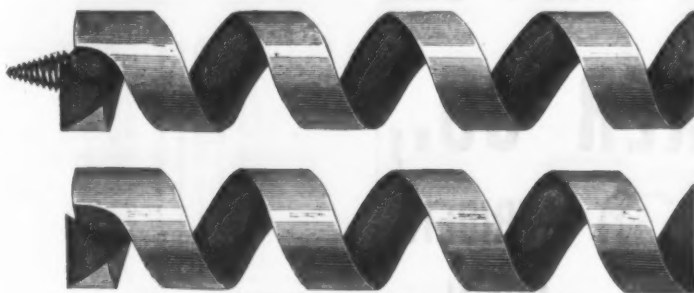
Also a full line of all the other styles of Tool Chests manufactured by them. Our New Illustrated Catalogue for Fall Season of 1883 will be issued about August 15th, and will be furnished on application, with prices. Every dealer in Hardware, Machinists' and Railway Supplies should keep a stock of these goods on hand at all times to supply the constant and increasing demand. We are the only company in the United States who make a business of manufacturing Tool Chests exclusively.

SNELL MANUFACTURING CO., Fiskdale, Mass.

IMPROVED SHIP AUGERS

AND

SHIP AUGER BITS.



These goods are produced from a special steel by

New and Improved Machinery.

and the labor is performed by skilled mechanics, who have made the manufacture of these goods a special study for many years, thus enabling us to place upon the market Ship Augers Superior to Any Ever Before Made.

They are so finished as to bore endwise or with the grain as readily as across it, or through the knottiest timber without swerving.

Ship Augers of extra length twist made to order, Shanks being left in any shape or length desired.

EVERY AUGER AND BIT WARRANTED.

TENNIS & WILSON, Sole Agents,
294 Broadway, NEW YORK.

MADE FROM ONE PIECE OF
CAST STEEL.

NO RIVETS OR HOLES
TO WEAKEN
THE BLADE.

THE REMINGTON SHOVEL

IT
WILL GIVE
BETTER SATISFAC-
TION THAN ANY OTHER
SHOVEL IN THE MARKET.

CIRCULARS & PRICES ON APPLICATION.

REMINGTON AGRICULTURAL CO., ILION, N. Y.

NEW YORK OFFICE: 118 CHAMBERS STREET.

Charles Kellogg. C. S. Maurice. Thos. C. Clarke. C. Macdonald. Geo. S. Field. Edmund Hayes.

UNION BRIDGE COMPANY,

Works: Athens, Pa.

Works: Buffalo, N. Y.

(Late Kellogg & Maurice.) Capacity, 14,000 tons. (Late Central Bridge Works.) Capacity, 12,000 tons.

CIVIL ENGINEERS AND CONSTRUCTORS

Iron & Steel Bridges, Viaducts, Roofs,

ELEVATED RAILROADS, MARINE PIERS, &c.

For Plans, Estimates and Tenders, address

UNION BRIDGE COMPANY, 52 Wall Street, NEW YORK.

TELEPHONE CALL: NEW 203.

MELLERT FOUNDRY & MACHINE CO., LIMITED.



Also Flange Pipe, for Steam or Water, of all sizes used. Special Castings, such as Branches, Bends, Reducers, Slices, &c. Stop Valves, Fire Hydrants, Reboilers, Lamp Posts, &c.

The Improved Canada Turbine Water Wheel.

MACHINERY AND CASTINGS FOR

Furnaces, Rolling Mills, Mining Pumps, Hoists, &c.

CAR CASTINGS, GIRDERS, COLUMNS, BRACKETS, IRON RAILING, &c., &c.

GENERAL OFFICE AT READING, PA.

SHIELDS & BROWN,

FOR MANUFACTURERS AND SOLE PROPRIETORS OF

BRADLEY'S

INSULATED AIR COVERINGS

FOR BOILERS AND STEAM PIPES.

Prevents Radiation of HEAT.

Awarded first and only Prize, Silver Medal, at the late National Railway Exposition.

Send for Illustrated Pamphlet, and mention The Iron Age.

80 Lake St., - CHICAGO.

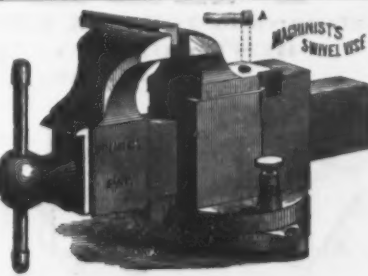
GEO. M. SCOTT,

Bellows Manufacturer,

Johnson Street,

Cor. 294 St.,

CHICAGO, ILL.



PRENTISS' PAT. VISES,

Adjustable Jaw.

Stationary or Pat. Swivel Bottoms.

ADAPTED TO ALL KINDS OF VISE WORK. ALSO

"PEERLESS" SWIVEL PIPE GRIP,

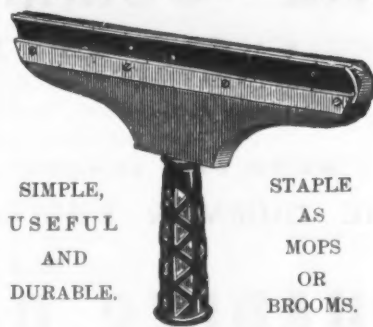
FITS ANY VISE. SOLD BY THE TRADE.

PRENTISS VISE CO.,

23 Day Street, New York.

SOLE PROPRIETORS. SEND FOR CIRCULAR

PERFECTION WINDOW CLEANER



SIMPLE,
USEFUL
AND
DURABLE.

STAPLE
AS
MOPS
OR
BROOMS.

Beware of Infringements.

FLOOR SCRUBBERS.



Perfection Window Cleaner Co.,
27 WASHINGTON STREET,
CHICAGO, ILLINOIS, U. S. A.

The Most Durable and Best Selling Bucket for Chain Pumps.

It has no valves to become obstructed and no screw joints to become immovable by rust.

Advantages of the Crosby Bucket over All Others—1. It has an air chamber on top, which conducts the air to the bottom of the well. 2. It is self-expansive, the base of the bucket being 1/4 of an inch larger at the bottom than bore in the tubes, which allows it to expand and the groove in the side to contract. 3. The wear comes on the whole side, and not on the extreme edge, like other buckets. 4. It contains more solid rubber than three of any other manufacture.

Three sizes—14 inch for deep wells, 16 inch for 40 feet or less, 2 inch for stock pumps. No charge for Territorial Rights. NONE GENUINE unless A. D. Crosby appears in raised letters on base of each Bucket.

Send for Price List. Agents wanted in every county. Address A. D. CROSBY, Patentee and General Agent, Cuba, Allegany County, N. Y. For sale by all General Hardware and Pump Dealers.

Grindstones, Emery, &c.

Walter R. Wood GRINDSTONES.

Berea, O., Nova Scotia, & other brands.
283 and 285 Front Street, New York.

GEO. CHASE,

The largest manufacturers in the world of

OIL STONE

Of all description.

107th Street and Harlem River.
Send for Illustrated Price List. NEW YORK.



OHIO GRINDSTONE COMPANY.

H. H. CLOUGH, Pres. L. P. HALDEMAN, Secy and Treas.
J. M. WORTHINGTON, V. Pt.

MANUFACTURERS OF

GRINDSTONES

OF ALL KINDS.

127 SUPERIOR ST.,

CLEVELAND, OHIO.

WORTHINGTON & SONS

MANUFACTURERS OF

GRINDSTONES,

ALSO

SCYTHE STONES

OF ALL SHAPES.

BEST CRIT KNOWN.

Finest Put Up Goods in the Market.

Cor. Front and River Sts., CLEVELAND, OHIO.

LOMBARD & CO.,

Importers and Dealers in all kinds of

GRINDSTONES,

Cor. Lewis Wharf & Atlantic Ave., Boston.

Stones for Machinists, Carpenters, Farmers and Glass Cutters constantly on hand and cut to order.



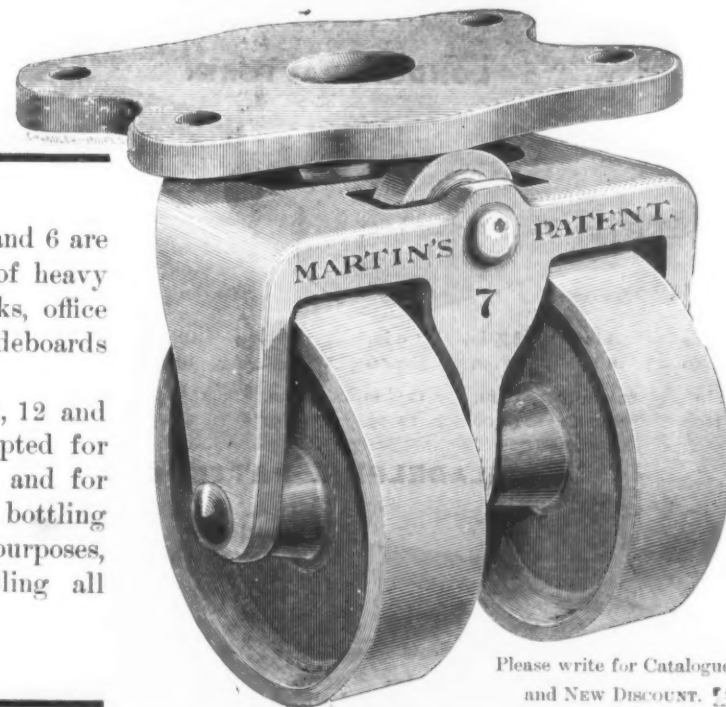
TUCKER'S ALARM TILLS.



Stove Trucks, Kraut and Slaw
Cutters, Wood Saw Frames,
Hoosier Folding Saw
Bucks, Bench Hooks,
Towel Rollers.

WRITE FOR PRICE LIST AND DISCOUNT.

PHOENIX CASTER CO., Indianapolis, Ind., MANUFACTURERS OF MARTIN'S PATENT CASTER.



Our Nos. 2, 3, 4, 5 and 6 are adapted for all kinds of heavy furniture, writing desks, office chairs, refrigerators, sideboards and book-cases.

Our Nos. 7, 8, 10, 11, 12 and 14 are especially adapted for all kinds of TRUCKS, and for fruit canning, beer bottling tables, and for factory purposes, for moving and handling all kinds of work.

Please write for Catalogue and New Discount.

EXCELSIOR AND CLIPPER LAWN MOWERS.

Excelsior Side Wheel.



For LIGHTNESS OF DRAFT, QUALITY OF WORK, SIMPLICITY OF ADJUSTMENTS and SUPERIOR WORKMANSHIP, our EXCELSIOR LAWN MOWERS, both for Hand and Horse Power, occupy the FIRST PLACE IN THE MARKETS OF THE WORLD.

Excelsior Roller.



Our NEW CLIPPER LAWN MOWER, which has been greatly improved for the coming season, is presented to the Trade after long and careful experiments with a view to produce a good Lawn Mower at a low price. Don't think the CLIPPER belongs to that worthless, trashy class of Lawn Mowers whose only recommendation is cheapness. It is a good Lawn Mower at a low price.

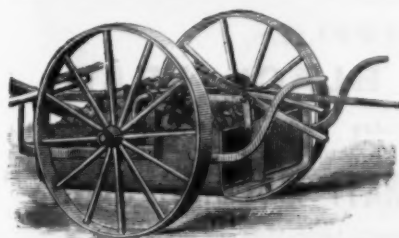
New Clipper.



In order to meet the varied demands of both home and foreign markets, we are making over 50 different styles and sizes of Lawn Mowers. Hence we can furnish a Lawn Mower suited to any climate or country. EVERY MOWER GUARANTEED. Send for Circular and Price List. Address

CHADBORN & COLDWELL MFG. CO., Newburgh, N. Y., U. S. A.,
Or 223 Upper Thames Street, LONDON, ENGLAND.

NASHUA LOCK COMPANY, NASHUA, N. H.



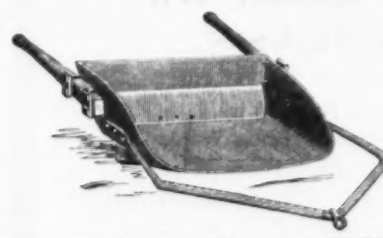
HASLUP'S PAT. WHEELED SCRAPER

Has great advantages over all others. It has More Capacity and is Easier Handled by Man and Team. Good on long or short hauls. Three sizes: 9, 13 and 16 cubic feet.

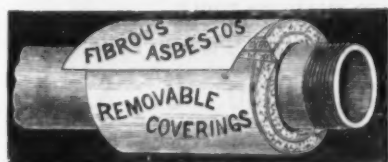
HASLUP'S ALL-STEEL DRAG SCRAPERS

Beat all others for capacity, durability, strength, light draft. Being ALL STEEL (except wood handles), are lighter, stronger and better made than any other. 3 sizes. Also, Township and Railroad Plows.

SIDNEY STEEL SCRAPER CO., Sidney, Ohio.

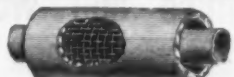


COVERINGS. SIDNEY SHEPARD & CO.'S



Made in sections three feet long to fit every size of pipe. Absolutely Fire-Proof—Light, Cheap. Can be applied by unskilled labor.

The Celebrated Patent Air Space Covering for Steam Boilers and Pipes, Hot Blast Piping, &c.



Asbestos Materials, Fibre, Millboard Packing and Cement.

CHALMERS-SPENCE CO.,
131 FIRST AVE., PITTSBURGH, PA. 419 & 421 EIGHTH ST., NEW YORK.



THE WILBER DOOR HANGER.

The Best in the World.
SO CLAIMED BY ALL USING THEM.

Being made of the very best malleable iron, cannot be broken; are heavily ribbed where needed; cannot be bent; easily put up; no cutting or grinding on small journal-pin, and can never, from use or wear, be forced from the track. Always working free and easy; no choking or binding. The force applied to the door is always transferred to a roller. No joints to pound and jump over. A continuous track (merchant bar, 3-16 or 1/4 x 1 1/2) is a cheap and desirable feature. Special inducements to the trade. Correspondence solicited.

J. D. WILBER, Manufacturer,
148 Dearborn Street, CHICAGO, ILL.

BARNES' Patent Foot and Steam Power MACHINERY.



Complete outfits for Actual Workshop Business. Lathes for Wood or Metal. Circular Saws, Scroll Saws, Formers, Mortisars, Tenoners, &c., &c. Machines on trial if desired. Descriptive Catalogue and Price List Free.

W. F. & JOHN BARNES,
No. 69 Ruby St., ROCKFORD, ILL.



OIL TANKS.

"QUEEN CITY," Sixty Gallons.

"EMERALD," Sixty Gallons.

PRICES SUPPLIED UPON APPLICATION.

OTHER SIZES MADE TO ORDER.

The "Queen City" oil tank is first quality in all respects. The "Emerald" is made of the same material, but lighter weight.

These tanks are made of Galvanized Iron, with wood underneath the metal bottom. They are handsomely painted and ornamented. The pump is movable, and can be used in pumping oil from barrels to the tank. The Drip Pan is a clean and safe receptacle for measures and funnels. A cover over all prevents the accumulation of dirt, evaporation and unpleasant odor of oil, and is secure from fire. The tank can be locked if desired. Orders respectfully solicited.

SOLE MANUFACTURERS,

SIDNEY SHEPARD & CO.,
Proprietors of the Buffalo Stamping Works,
BUFFALO, N. Y.



ROLLING MILL TOOLS.

Roll-Turning Tools, Roll-Turning Plugs.

ALSO

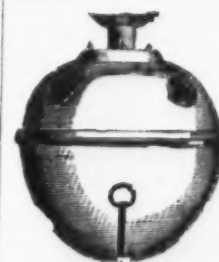
Shear Knives, Circular and Straight, made from SPECIAL STEEL.

S. Tretheway, 49th Street Tool Works, Pittsburgh.

PORTABLE FORGES.

Send for Catalogue to

EMPIRE PORTABLE FORGE CO.,
COHOES, N. Y.



Established 1838.
Bevin Bros. Mfg. Co.,
Easthampton, Ct.
Manufacturers of
SLEIGH BELLS,
House, Tea, Hand,
Gong Bells, &c.
Bell Metal Kettles.

TINUS OLSEN & CO.,
STANDARD SCALES

Testing Machines.

Manufacturers of all descriptions of Testing Machines. Tests made daily.

Office and Works, N. W. cor. 19th and
Huttonwood Sts., Philadelphia.

BISSELL & NORRIS,
ANALYTIC CHEMISTS,
Bissell Block, PITTSBURGH, PA.

Special attention paid to the Analysis of Mill and Furnace Supplies and Products. Co-tracts made for doing regular work. Price List on application.

PECK'S
CELEBRATED HATCHETS

Constantly on Hand and for Sale by

JOHN BROWER,
81 Murray St., NEW YORK.

Brick Trowels.

We desire to call the attention of the trade to the superior quality of Brick and other Trowels of our manufacture. We are now making a specialty of this branch of business, and with confidence guarantee them to be the best Trowels in the market.

LONDON PATTERN.



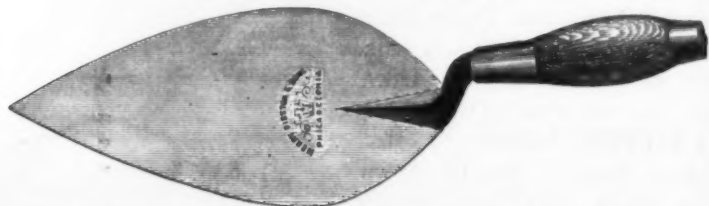
7 1/2 in.	8 in.	8 1/2 in.	9 in.	9 1/2 in.	10 in.	10 1/2 in.
\$7.50	8.00	8.50	9.00	9.50	10.00	10.50 per dozen.
11 in.	11 1/2 in.	12 in.	12 1/2 in.	13 in.	13 1/2 in.	14 in.
\$11.00	11.50	12.00	12.75	13.50	14.25	15.00 per dozen.

PHILADELPHIA PATTERN.



7 1/2 in.	8 in.	8 1/2 in.	9 in.	9 1/2 in.	10 in.	10 1/2 in.
\$9.50	10.00	10.50	11.00	11.50	12.00	12.50 per dozen.
11 in.	11 1/2 in.	12 in.	12 1/2 in.	13 in.	13 1/2 in.	14 in.
\$13.00	13.50	14.00	14.75	15.50	16.25	17.00 per dozen.

BOSTON PATTERN.



6 in.	6 1/2 in.	7 in.	7 1/2 in.	8 in.	8 1/2 in.	9 in.	9 1/2 in.	10 in.	10 1/2 in.
\$5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00 per dozen.

H. Disston & Sons,

PHILADELPHIA.

MERCHANT & CO.

NEW YORK, PHILADELPHIA,
TIN PLATE and METALS,
Bare and Insulated Copper Wire,
SHEET BRASS.

Low Sheet Brass,	Low Brass Wire,
Spring Sheet Brass,	Spring Brass Wire,
High Sheet Brass,	High Brass Wire,
Hoop Brass,	Flat, Square, Half-Round
Engraver's Brass,	Brass Rods,
Brass Circles,	Round Brass Rods,
Gilding Metal,	Copper Wire,
German Silver,	German Silver Wire,
Sheet Copper,	Seamless Brass Tubes,
Copper Circles,	Seamless Copper Tubes,
Planished Copper,	Brazed Brass Tubes,
Zinc Battery Plates,	Brazed Copper Tubes,
Brass Wire Cloth,	Copper Rivets and Burs.

BRONZE METAL.



THE NEW LACING, "HERCULES."

PAGE BELTING COMPANY,

CONCORD, N. H.

Also, Manufacturers of

Superior Leather Belting.

WE ARE THE EXCLUSIVE MANUFACTURERS OF
BYRKET'S IMPROVED DUMP AND
AUTOMATIC STEEL SCRAPERS.

We manufacture the only successful Automatic Scraper in the world. Our Dumps are the lightest and strongest Scrapers made. We use two pieces of steel pressed into shape, which is superior to the old method of using but one piece, for when that breaks the whole scraper is ruined, while ours is so constructed that we can replace any part at a trifling expense. We make three sizes, to meet the wants of all classes of Earth Workers. Especially suited for Contractors and Township Road Work. Send for circulars. Manufactured by

The Champion Scraper Co.,
TROY, OHIO.



Improved Champion Dump Scraper.

B. KREISCHER & SONS, FIRE BRICK.

BEST AND CHEAPEST.

Established 1845.
Office, foot of Houston Street, East River,
NEW YORK.

NEWTON & CO., ALBANY, N. Y.

MANUFACTURERS OF BEST QUALITY
FIRE BRICK
AND
STOVE LININGS.

M. D. VALENTINE & BRO.,

Manufacturers of

FIRE BRICK
And Furnace Blocks,
DRAIN PIPE AND LAND TILE,
Woodbridge, - - N. J.

BORGNER & O'BRIEN,
Manufacturers

FIRE BRICK
AND
Edge Pressed Furnace Blocks,
CLAY RETORTS, TILES, &c.,
Twenty-third Street,
PHILADELPHIA.

Above Race, Twenty years' practical Experience.

WATSON FIRE BRICK CO.,
ESTABLISHED 1864.

Successors to JOHN R. WATSON, Perth Amboy, New Jersey
Manufacturers of

FIRE BRICK,
FOR ROLLING MILLS, BLAST FURNACES, FOUN-
DRIES, GAS WORKS, LIME KILNS, TANNERIES,
BOILER AND GRATE SETTING, GLASS WORKS, &c.
Fire Clays, Fire Sand, and Kaolin for Sale.

TROY FIRE BRICK WORKS,
Troy, N. Y.,
JAMES OSTRANDER & SON,
Established 1848. Manufacturers of

FIRE BRICK,
Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and
Dealers in Woodbridge Fire Clay and Sand, and Staten
Island Kaolin.

Established 1864.
JAMES GARDNER,
Successor to GARDNER BROS.,
MANUFACTURERS OF

"STANDARD SAVAGE" FIRE BRICK,
TILE & FURNACE BLOCKS,
OF ALL SIZES AND KINDS.

Miner and Shipper of "Mount Savage" Fire Clay.
WORKS, Ellerslie, Allegheny Co., Md.
MAIN OFFICE, Cumberland, Md., P. O. Box 93.
BRANCH OFFICE, Pittsburgh, Pa., P. O. Box 373.
S. M. Hamilton & Co., Agts., Baltimore, Md.

UNION MINING COMPANY.
Mount Savage Fire Brick.
EDWARD J. ETTING, Agent,
322 South Third St., Philadelphia, Pa.

Woodbridge Clay Mining & Refin'g Co.,
FIRE BRICK,
Fine Clays Mined and Washed for Whiteware, Paper
and Glass Works.

Main Office, Works and Mines at
Spa Springs, Woodbridge, N. J.
Secretary and Treasurer's Office,
Reading, Pa.

CRIBBS'
HARPOON HAY
FORK.

THE BEST MADE.
Thousands in Use.

The cut represents
the Harpoon Hay
Fork with Straw At-
tachment, which
may be affixed or re-
moved as desired.

We Want Agents
Everywhere.
Manufacturers also
of the
EUREKA HORSE HAY
FORK.

Send for Circular to
J. J. Cribbs & Co.,
901 North Main St.,
ST. LOUIS, MO
Mention The Iron
Age.

Self-Binders for The Iron Age.

PRICES.
Full Cloth...\$1.25
Half Roan...\$1.50

We are now prepared to supply our sub-
scribers with an excellent self-binder for
their papers, a cut of which is annexed.
We call attention to the low prices at which
it is offered. Address all orders to

DAVID WILLIAMS,
83 Reade Street, New York.

The Iron Age
Self-Binder.

WOODLAND FIRE BRICK CO., LIMITED,
Woodland, Clearfield Co., Pa.,
MANUFACTURERS OF
"WOODLAND" BRAND FOR STEEL FURNACES OF ALL KINDS, BLAST FURNACES AND
MALLEABLE IRON WORKS.

"BRADFORD" Brand for Rolling Mills, Glass Houses, &c.
"W. F. B." Brand for Hot Blast Stoves, Stacks, Cupolas, and all work requiring a cheap
grade of brick. Also, Fine Ground Clay to lay brick.
Address all Communications to Woodland, Pa.

FIRE BRICK, CLIMAX FIRE BRICK CO.,
Successors to Red Bank Fire Brick Co.,
Blast Furnace and Steel Hole Brick
A SPECIALTY.
THOS. JOHNSTON, Agt., P. O. Box 976, Pittsburgh, Pa.

White Mountain Freezer Co.,
MANUFACTURERS OF
Sands' Patent Triple Motion
WHITE MOUNTAIN
Ice Cream Freezer.

The only Freezer ever made having three distinct
motions, thereby producing flatter, smoother Cream than
any other Freezer on the market. Acknowledged by
every one to be the best in the world. Over 800,000
in use to-day. Outside Irons Galvanized, but all inside the
can coated with Pure Block Tin. Tubs water-proof;
easily adjusted and operated. We also carry large stock
of Packing Tubs, Packing Cans, Ice Crushers, &c. Send for
Price List and Trade Discounts. Address

White Mountain Freezer Co.,
101 E. HOLLIS ST., NASHUA, N. H.

KELLY STEEL BARB WIRE.
Barbs 3 inches apart stand in all directions.
YIELDING STEEL BARB, ACTING LIKE A NATURAL THORN.
Lightest Weight per Rod. Painted and Galvanized. Only one Agent in each town. Address
THORN WIRE HEDGE CO.,
CHICAGO, ILL.

THE CLARK MFG CO. MANUFACTURERS OF
BUILDERS' HARDWARE
BUFFALO, N. Y.

THE LARGEST FACING MILLS IN THE WORLD.
Capacity, 650 Barrels Per Day.
S. OBERMAYER & CO.,
Manufacturers of and Dealers in All Kinds of
Foundry Facings, Blackings,
AND
FOUNDRY SUPPLIES.
PLUMBAGO OR BLACK LEAD
For Lubricating, Electrotyping, Foundry and All Other Purposes.
ALSO SHIPPERS OF
THE CELEBRATED CININNATI MOLDING SANDS,
For Stove Plate, Heavy and Light Machinery, Agriculture and Brass Work.
Heavy Machinery and Fine Stove Plate Facings a Specialty.
AGENTS FOR MONK'S CELEBRATED MOLDERS' TOOLS.
SEND FOR ILLUSTRATED CATALOGUE AND PRICE LIST.
Office and Works, Cincinnati, Ohio, U. S. A.

Bemis & Call Hardware & Tool Co.
PATENT COMBINATION WRENCH.
These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened
throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches,
but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no
equal.
For Circulars and Price List, address
BEMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.
ESTABLISHED 1837.

L. & I. J. WHITE,
MANUFACTURERS OF
EDGE TOOLS and MACHINE KNIVES
Coopers', Carpenters' and Ship Tools, Cleavers, &c.
SOCKET CHISELS,
FIRMER, FRAMING, MILLWRIGHT, PARING AND CORNER.
310, 312 & 314 EXCHANGE STREET, BUFFALO, N. Y.

CRONK HANGER CO.,

ELMIRA, N. Y.

WROUGHT IRON SLIDE

BARN DOOR HANGERS

FOR WOOD TRACK.

PATENTED FEB. 13, 1883.

Can be operated by a child.

SPECIAL POINTS:

Simplicity, Durability, Strength and Finish.

ADJUSTABLE
STAY ROLLER.



Send for sample case and circulars.

General Eastern and Southern Agent:

JOHN F. LOVEJOY, 102 CHAMBERS ST.
New York City.

MONTGOMERY & CO.,

IMPORTERS

Stubs' Files, Tools and Steel, Grobet Swiss Files

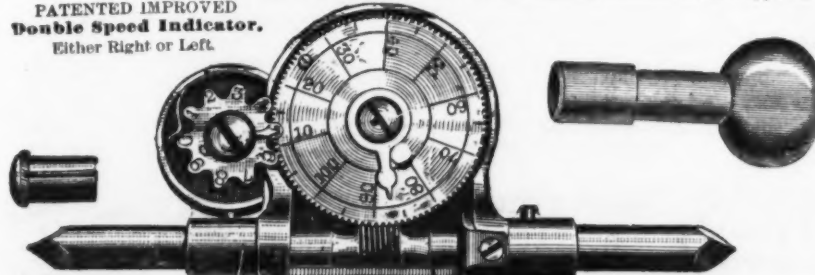
CHESTERMAN'S MEASURES,

Hubert's French Emery Paper, Horseshoe Magnets, &c.

WM. SMITH & SON'S CELEBRATED MUSIC WIRE, Nos. 2 to 30
French Sheet Steel, 3-1 in. wide, from 4 to 65 thousandths.

Machinists', Silversmiths', Jewelers', Die Sinkers' and Sewing Machine Manufacturers' Supplies.

PATENTED IMPROVED
Double Speed Indicator.
Either Right or Left.



GEO. W. MONTGOMERY,
GEO. W. CHURCH.

105 Fulton St., NEW YORK.

STEPHENS'

VISES

SOLID JAWS.

And Adjustable attachments. Steel-Faced, or
Solid Steel Sliding Bar. Especially adapted
for heavy chipping and Locomotive Works. For
every kind of vise work it maintains its supe-
riority in strength, firmness of grip, dura-
bility, make and saving of time and labor.

For Sale by the Trade.

SEND FOR CIRCULAR.
Nathan Stephens,
PROPRIETOR,
41 Dey St., New York.



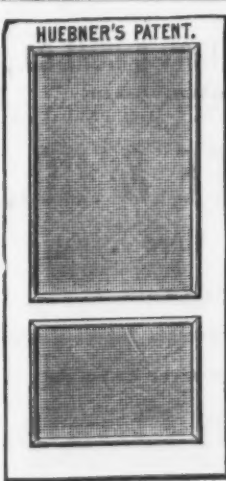
J. E. REDFIELD,

MANUFACTURER OF

TAPS, REAMERS, SCREW PLATES, &c.

ESSEX, CONN.

Our Taps are all Machine Relieved, and we guarantee them to give satisfaction.



HUEBNER MANUF'G CO.,

MANUFACTURERS OF

Pat. Door Screens,

ADJUSTABLE WINDOW SCREENS

AND

Window Screen Brackets & Frames.

Factory, 236 to 238 E. Fort Street,
DETROIT, - - - MICHIGAN.

SEND FOR PRICE LIST.

BUTLER & CONSTANT,

18 Warren St., New York, Eastern Depot.

SOLD BY HARDWARE DEALERS EVERYWHERE.

PRIZE MEDALLISTS.

Exhibitions of 1862, 1863, 1867, 1872, 1873, and only Award and Medal for Noiseless Steel
Shutters at Philadelphia 1876, Paris 1878, and Melbourne 1881.

CLARK, BUNNETT & CO., Limited,

Late CLARK & COMPANY,

Original Inventors and Sole Patentees of

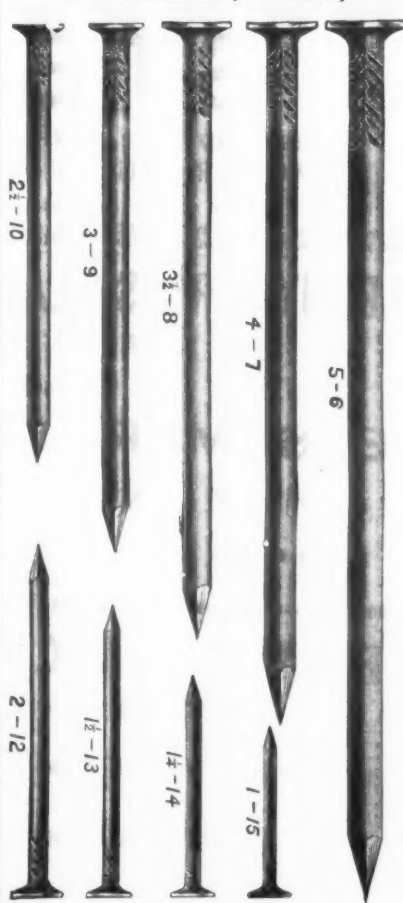
Noiseless, Self-Coiling, Revolving Steel Shutters.

Fire and Burglar Proof. Also, improved ROLLING WOOD SHUTTERS of various kinds, and Patent
METALLIC VENETIAN BLINDS.

Office and Manufactory, - - 162 & 164 West 27th Street New York.

THE HP NAIL CO.,

CLEVELAND, OHIO.



MANUFACTURERS OF

WIRE NAILS

OF ALL KINDS.

Barbed or Plain Steel, Iron and Brass
Nails, Cast Steel Wire Brads, Cast Steel
Wire Finishing Nails, Cigar Box Nails, Es-
cutcheon Pins, Wagon Nails, Clinch Nails,
Hinge Nails, Wire Spikes for Track, Bridge
and Dock Work, Tinned Nails, Galvanized
Nails.

AN IMPROVED LEVELING INSTRUMENT.



PRICE OF INSTRUMENT COMPLETE, \$20.
Adapted to the Use of Architects, Engineers, Masons,
Builders, Farmers and Others.

This instrument is made of Brass and Iron, fur-
nished with both masons' (short metal) and survey-
ors' tripod, and put up in a handsome wooden box
with strap. The only low-priced level that can be
thoroughly adjusted in the field.

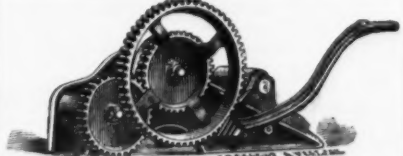
A NEW LEVELING ROD.

This rod is round and made in two sections; it
is united by a solid screw joint, as if of one length, and
has a target. There are two scales, one side being
engineers' (feet, inches and tenths), the other Archi-
tects' scale (or, feet, inches and sixths). Price, \$6.

WM. T. COMSTOCK, Manufacturer.

6 Astor Place, New York.

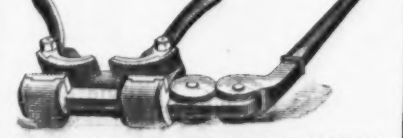
Circulars and discount to hardware trade furnished
to dealers sending their card.



Quick Adjustable Tire Bender.

SIZES.....No. 1 and No. 2.

PRICES.....\$12 " \$14.



IMPROVED AUTOMATIC TIRE AND AXLE UPSETTER.

SIZES.....No. 1 and No. 2.

PRICES.....\$12 " \$14.

E. C. TROMBLY & CO. MFG. CO.,

PLATTSBURGH, N. Y. Box 310.



ROMER & CO., Manufacturers of Patent Jail
Padlocks, Brass and Iron Padlocks, Carriage
Lamps and Lanterns, 26 to 42 Summer Avenue,
Newark, N. J. Illustrated catalogues sent to the
trade on application.



GEO. M. EDDY & CO.,

Manufacturers of

Measuring Tapes

Of Cotton, Linen & Steel,

FOR ALL PURPOSES.

381 to 353 Classes Ave., Brooklyn, N. Y.

THE EBERHARD MFG. CO.,

CLEVELAND, OHIO.

Malleable Iron Carriage
Wagon and Saddlery

HARDWARE.

MALLEABLE IRON CASTINGS ALSO MADE TO
ORDER FROM SPECIAL PATTERNS.

Large variety in each line. New patterns, producing
original designs, and goods better adapted to practical
use than ever, offered to and through the hardware
trade. Large stocks; prompt delivery.

SEND FOR CATALOGUE AND PRICES.



WITHINGTON & COOLEY MANUFACT'G CO.,

JACKSON, MICHIGAN.

Specialties for the Lawn

FOX'S LAWN RAKE

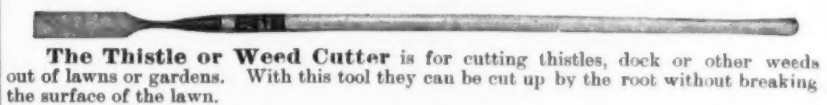
Patented Aug. 2, 1881.



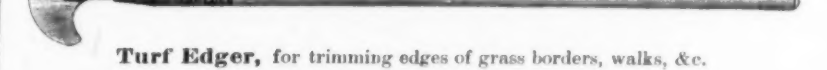
20-inch Head. 29 Steel Teeth.

Steel Wire Brace.

Unexcelled for the removal of clippings from the lawn mower, dry mulch and leaves
from the lawn.



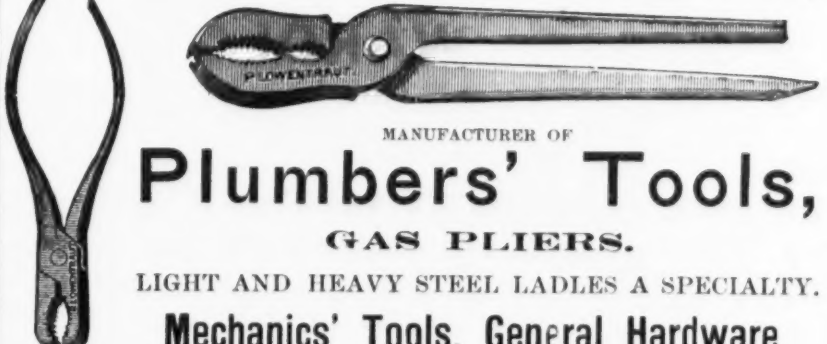
The Thistle or Weed Cutter is for cutting thistles, dock or other weeds
out of lawns or gardens. With this tool they can be cut up by the root without breaking
the surface of the lawn.



Turf Edger, for trimming edges of grass borders, walks, &c.

Hoes, Forks, Scythe Snaths, Grain Cradles, &c.

P. LOWENTRAUT,



MANUFACTURER OF

Plumbers' Tools,

GAS PLIERS.

LIGHT AND HEAVY STEEL LADLES A SPECIALTY.

Mechanics' Tools, General Hardware

HOUSE-FURNISHING GOODS AND SHOEMAKERS' TOOLS.

Also Manufacturer of the

Celebrated Eureka Club Skate and New Self-Adjusting Wrench.

SEND FOR CATALOGUE AND PRICE LIST.

276, 278, 280, 282 HALSEY STREET, NEWARK, N. J.

LANE'S MEASURING FAUCET.

Price, \$3.00.

For Light or Heavy Molasses, Oils,
Varnishes or other Fluids.

We warrant these Faucets to be as repre-
sented, measuring correctly and working
more easily in heavy molasses than any mea-
suring Faucet in the market. No grocer can
afford to be without them, for they save time,
and "time is money." They insure perfect
cleanliness, requiring no tin measures or fun-
nel to collect dirt and draw files. They do not
drip. They prevent all waste, as no molasses
or other fluid can pass except when the crank
is turned. They are the embodiment of sim-
plicity, and consequently they are always in
order. They work easily in the heaviest mo-
lasses. They are warranted to measure cor-
rectly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY

LANE BROS., Poughkeepsie, N. Y.

General Agency, GRAHAM & HAINES, 113 Chambers St., New York.



HANDLES FOR MANUFACTURERS.

From Selected Stock, Thoroughly Seasoned, Well Made.

Orders solicited from close buyers who want good work

RIPLEY MANUFACTURING CO.,

Unionville, Conn.,

Manufacturers of

"Common Sense" Mouse Traps, Mallets, Porcelain-Lined
Lemon Squeezers, Boot Jacks, Faucets and Hardware.



THE HARTFORD HAMMER CO., Hartford, Conn.

Manufacturers of Solid Cast Steel Hammers

fully WARRANTED.

All Hammers stamped "HARTFORD" are

See first issue of each month.

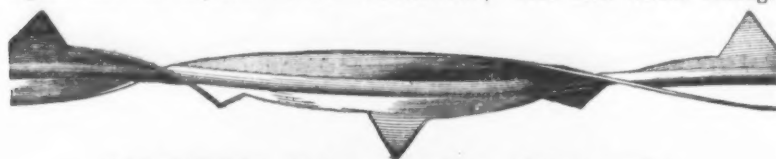
GRAHAM & HAINES, Sole Agts., 113 Chambers St., N. Y.

R. H. WOLFF & CO., Limited,
MANUFACTURERS OF
STEEL WIRE
FOR ALL PURPOSES.

Special Finest CAST STEEL WIRE.
Market Steel Wire, Prime Coppered Spring Wire, Tempered and Untempered Steel Wires, in Long Lengths, for Crinoline, Corset, Lock and Brush Makers, and all Special Purposes.

ALL KINDS OF FURNITURE SPRINGS.
IMPORTERS OF
IRON, STEEL, & RAILS of Every Description.
Wire Rods, Plain and Galvanized Wires, &c., Gun Barrels, Moulds, and Ordnance.

Shipments in bond from American Ports, and direct from Europe to all parts of the World.
EXPORTERS AND GENERAL MERCHANTS.
WORKS: NEW YORK CITY, BRIDGEPORT, CONN., AND JERSEY CITY, N. J.
Agents and Sole Importers of the "BUCKTHORN," Solid Steel Barbed Fencing.



CALVANIZED PLAIN TWISTED FENCE STRIP.

Office and Warehouse, 93 John Street, New York.

MILLER, METCALF & PARKIN,
Pittsburgh, Pa.,
Manufacturers of
CRESCENT STEEL,
In Bars, Sheets, Cold-Rolled Strips, &c.
Polished, Compressed Drill Rods and Wire.
Warranted equal to any imported in quality, finish and accuracy.
Also Common Grades.

J. & RILEY CARR, SHEFFIELD, England.
ESTABLISHED 1810.
Sole Importers and Manufacturers of the
Celebrated "Dog Brand"

STEEL



FILES.

BRIGHT COLD ROLLED STEEL,
PATENT WROUGHT IRON STEEL FACE ANVILS,
FARRIERS' KNIVES, HAMMERS, PINNERS, &c.
Warehouse 30 Cold St., New York. HENRY W. BELCHER, Agent.

S. & C. WARDLOW,
Sheffield, England,
Manufacturers of the Celebrated

Cast and Double Shear STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

Warehouse, 95 John Street, New York.

WILLIAM BROWN, Representative.

CLEVELAND ROLLING MILL CO.,
CLEVELAND, OHIO.
MANUFACTURERS OF

BESSEMER AND SIEMENS-MARTIN STEEL BLOOMS AND BILLETS,
BESSEMER STEEL RAILS, IRON RAILS & FASTENINGS.

Steel Street Rails, Wire, STEEL TIRE and FORGINGS, Iron and Steel Angles, Bar and Spring Steel, SOFT WELDING STEEL for Tools and Agricultural Work, Corrugated Roofing and Siding, IRON AND STEEL ROLLER PLATE, Galvanized and Black Sheet Iron, STANDARD CAST STEEL.

WESTERN AGENCY, 91 Lake St., Chicago. NEW ENGLAND AGENCY, 230 Franklin St., Boston. N. D. PRATT, Agent. JOHN WALES & CO., Agents. New York Agency, 23 Astor House. CINCINNATI AGENCY, 181 Walnut St., CHARLES B. MELISH, Agent.

W. W. SCRANTON,
President.

WALTER SCRANTON,
Vice-President.

E. P. KINGSBURY,
Sec'y and Treas.

THE SCRANTON STEEL COMPANY,
MANUFACTURERS OF
STEEL RAILS & BILLETS.

Works at Scranton, Pa.

New York Office, - - - 56 Broadway

THE MIDVALE STEEL CO.,
NICETOWN, PHILADELPHIA.

Best Warranted Cast Steel for Machinists' Tools,
Taps, Dies, Punches, Shear Blades, Chipping Chisels and Granite Rock Drills,
Extra Mild Center Steel, special for Taps;

MACHINERY AND CAST SPRING STEEL HEAVY AND LIGHT FORGINGS.

Warehouse, No. 12 North 5th St., Philadelphia.

Address A. M. F. Watson, General Sales Agent.

STEEL Gautier Steel.
See Page 3.

LABELLE STEEL WORKS.

SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF

STEEL.

Also Springs, Axles, Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, PITTSBURGH, PA.

Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND & CO., 614 and 616 Market St.; at Cleveland by CONDIT, WICK & CO., 113 Water St.

ALBANY & RENSSELAER IRON & STEEL CO.,
TROY, N. Y.,
MANUFACTURERS OF

BESSEMER STEEL RAILS,

FISH PLATES, BOLTS, NUTS, SPIKES, &c.

Machinery Steel, Merchant and Ship Iron.

CHESTER GRISWOLD, Vice-President, - 56 Broadway, New York City.

FRANCIS HOBSON & SON,
97 John Street, NEW YORK.

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

CHAS. HUGILL, Agent.

ANDERSON, DU PUY & CO.,

(Successors to ANDERSON & CO.) Manufacturers of all Descriptions of

Tool,
Machinery,

STEEL.

Agricultural,
&c.

Works and Office at Chartiers Station, P. & L. E. R. R. Branch Office, Cor. Ross & First Aves.
PITTSBURGH, PA.

D. H. KENT & CO., Limited, Agents,
1009 Arch St., Phila., Pa.

M. T. MILES & SON, Western Agents,
170 Lake St., Chicago.

80 John St., **F. W. MOSS,** NEW YORK.

CELEBRATED and OLD-ESTABLISHED BRANDS OF

"MOSS" AND "MOSS & GAMBLE'S" STEEL.
Warranted for Tools, Taps, Dies, Chisels, &c.

Warranted Superior to any Steel in the Market, either English or American, for every purpose.

Also,
Combination Chrome Steel and Iron for
Safes, Jails and Deposit Vaults.

Send for Circular
and
Price List.

CHROME CAST STEEL.

Chrome Steel Works,

Kent Avenue and Keap Street,
BROOKLYN, N. Y.

Chicago Branch,
S. D. KIMBARK, Agent.

Cincinnati Branch,
N. E. cor. 5th & Main Streets.

WILLIAM JESSOP & SONS,
LIMITED,
91 JOHN STREET, NEW YORK.

SOLE MANUFACTURERS OF

JESSOP'S BEST CAST STEEL,

IN GREAT VARIETY OF SIZES.

Best Circular Saw Plates, Double Shear Steel, Sheet Steel,
DIE STEEL, &c.

Gold Medals awarded at Exhibitions of Paris, 1878, and Melbourne, 1881.

Branch Warehouses throughout the United States and Canada.

MANUFACTORY, - - - SHEFFIELD, ENGLAND.

THE MONTOUR IRON & STEEL COMPANY.

WORKS AT DANVILLE, PA.

PIG IRON, T AND STREET RAILS,

RAIL JOINTS AND SPIKES,

Bar Iron, Mine Car Wheels, Axles and Breaker Machinery.

W. E. C. COXE, President,
Reading, Pa.

F. P. HOWE, Gen'l Supt.,
Danville, Pa.

S. W. INGERSOLL, Treasurer,
208 South Fourth St., Philadelphia, Pa.

PITTSBURGH BESSEMER STEEL CO
(LIMITED),

STEEL RAILS

LIGHT RAILS A SPECIALTY.

P. O. Address, 87 Wood Street, Pittsburgh, Pa.

R. MUSHET'S
Special Steel

FOR

LATHES, PLANERS, &c.

Turns out at least double work by increased speed and feed, and cuts harder metals than any other steel. Neither hardening nor tempering required.

Sole Makers,

SAMUEL OSBORN & CO.,
Sheffield, England.

Represented in the United States by

B. M. JONES & CO.,
Nos. 11 & 13 Oliver Street, BOSTON.

NAYLOR & CO.,

99 John St., New York. 6 Oliver St., Boston, Mass.

205 S. Fourth St., Philadelphia, Pa.

IMPORTERS OF

STEEL AND IRON RAILS,

Tin and Terne Plates,

Swedish and Norway Iron,

BESSEMER STEEL WIRE RODS.

Pig Iron, Spiegeleisen, Ferromanganese, Scrap Steel and Old Iron Rails.

MANUFACTURERS OF

STEEL COMPRESSED SHAFTING,

"Benzon" Homogeneous Plates

For Boilers, Fire-boxes, &c.

Axles, Crank Pins, Spring Steel,

And all other kinds of

Martin-Siemens Steel and Iron

For Railroad purposes.

The Iron-Masters' LABORATORY.

Exclusively for the

Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestones, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 139 Walnut St., Philadelphia.

With Branch at Warrenton, Virginia.

J. BLODGET BRITTON.

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore..... \$4.00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12.50
For each additional constituent of usual occurrence..... 1.50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.
For determining the per cent. of Sulphur or Phosphorus in iron or steel..... 7.00
For each additional constituent of usual occurrence..... 6.00
For the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone..... 10.00
For each additional constituent..... 2.00
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 12.50
For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an ore.
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.
Printed instructions for obtaining proper average samples for analysis furnished upon application.

BRIER HILL PIG IRON.

Annual Capacity, 100,000 Tons.

WE MAKE FOUR GRADES, TO-WIT:

BESSEMER, for Bessemer Rails and Open Hearth use; made from Lake Superior ores.

BRIER HILL SCOTCH, used as a softener and for carrying scrap; equal to Imported Scotch.

BRIER HILL or TOD FOUNDRY, extra strength; made from Lake Superior ores.

IRON RIVER FOUNDRY, medium strength; suitable for small castings and general use.

Special attention given to grading our Foundry Iron. Write for Prices.

THE BRIER HILL IRON & COAL CO.,

YOUNGSTOWN, OHIO.

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,

237 South Third Street,

PHILADELPHIA,

No. 111 Broadway, New York,

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.:

A. Pardee & Co. [HAZLETON, CRANBURY, SUGAR LOAF, LATIMER.]

Pardee, Bro. & Co. [HOLLYWOOD.]

Calvin Pardee & Co. [MT. PLEASANT.]

Pardee, Sons & Co. [MT. PLEASANT.]

THOS. FIRTH & SONS, Limited, SHEFFIELD, Crucible Cast Steel.

JERE. ABBOTT & CO..

AGENTS AND IMPORTERS OF

SWEDISH IRON,
35 Oliver St., BOSTON. 23 Cliff St., NEW YORK.GUSTAF LUNDBERG,
AGENT FORN. M. HÖGLUND'S SONS & CO.,
OF STOCKHOLM.SWEDISH & NORWAY IRON,
38 KILBY STREET, BOSTON.

ALBERT POTTS, Philadelphia Agent, 234 & 236 N. Front Street.

PAGE, NEWELL & CO.,

139 MILK STREET, BOSTON.

IMPORTERS OF

Swedish and Norway Iron,

INCLUDING

Charcoal, Siemens-Martin and Bessemer Productions, Bars, Shapes, Rods,
Billets, Blooms, Wrought Scrap Iron, Scrap Steel, &c.

DELIVERIES MADE AT ALL PROMINENT AMERICAN, CANADIAN AND PROVINCIAL PORTS.

SWEDISH IRON & STEEL.

LEWANDER & CO.,

AGENTS FOR

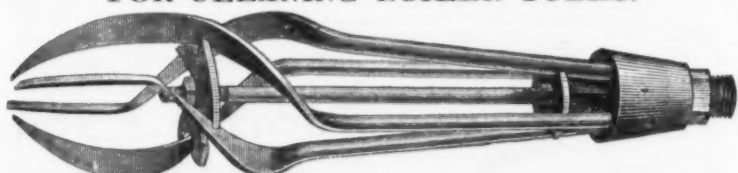
L. G. BRATT & CO., of Gothenburg, Sweden

BRANCH OFFICE:

MAIN OFFICE:

116 La Salle St., CHICAGO.

12 Post Office Square, BOSTON, MASS.

The Spiral Flue Scraper,
FOR CLEANING BOILER TUBES.

The Best, Cheapest, Strongest, Simplest. Shears out the scale without cutting the metal of the tubes. Does not catch when pushed clear through. Can be adjusted to the wear, and wears sharp. It does not anneal and collapse when put in a hot boiler. Has four times the scraping surface of other scrapers. Has no bolts or rivets. Send for descriptive circular. Manufactured by
JACKSON FLUE SCRAPER COMPANY,
Sole Proprietors and Manufacturers, JACKSON, MICH.

BARKER HDW. CO.,

THE AUTOMATIC.

CINCINNATI, OHIO.

MANUFACTURE THE

PEERLESS

DOOR SPRINGS,

ECLIPSE

DOOR SPRINGS

AND

SPRING HINGES,

Automatic & Japanese

SPRING HINGES.

GREATLY REDUCED PRICES ON THE
AUTOMATIC HINGES.

Three-inch, single-acting. Tension fastened automatically. Best of materials, and the springs, which are made much larger than in any other similar hinge, will not set. Provided with a new device which prevents the pin from gradually working out, making it the best hinge in the market.
Price, \$15 per gross Pairs.
Send for Special Discount.

THE ROUSE PIPE AND BOLT WRENCH.

Drop Forged of Tool Steel.

Any parts broken by fair usage replaced without charge.

R. R. ROUSE Manufacturing Co., Indianapolis, Ind.

N. Y. Office, J. Q. Maynard, Mgr., 12 Cortlandt Street, Chicago, Ill.

PANCOAST
& MAULE
Agents,
Phila., Pa.

CHEMICALS AND APPARATUS

FOR THE ANALYSIS OF

ORES, IRON, STEEL, FUEL, FLUXES, FURNACE GASES, &c.

Our Specialty. Being direct Importers and Manufacturers we can offer superior inducements.

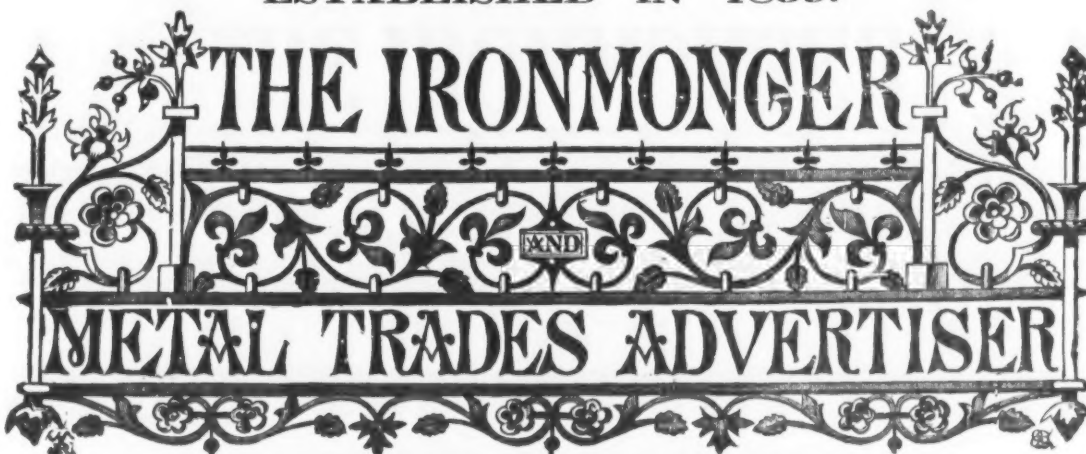
EIMER & AMEND, Nos. 205 to 211 Third Avenue.

NEW YORK.

Eighteenth Street Station Elevated R. R.

Illustrated Catalogue Mailed on Application.

ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 42 CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:
NEW YORK OFFICE: DAVID WILLIAMS, Publisher of *The Iron Age*, 83 Reade street, who will, on receipt of application, supply specimen copies free.

PITTSBURGH OFFICE: 77 Fourth Avenue—JOS. D. WEEKS,
Manager and Associate Editor.
PHILADELPHIA OFFICE: 250 South Fourth Street—THOMAS
HOBSON, Manager.

CINCINNATI OFFICE: 13 West Third Street—HENRY SMITH,
Manager.
SOUTHERN OFFICE: Cor. Eighth and Market Streets Chatta-
nooga, Tenn.—S. B. LOWE, Manager.

CHICAGO OFFICE: 36 and 38 Clark Street, Cor. Lake Street—J. K. HANEY, Manager.

SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.
Special Correspondents.—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts in which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. *The Week Legal Notes, Trade Notes, Bankruptcies, Foreign Notes, Colonial Settings, Merchants' Circulars, &c.*, are each departments of the journal containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French, Belgian and other Special Correspondence.

SUBSCRIPTIONS

to the *Ironmonger and Metal Trades' Advertiser*, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is \$5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful *Ironmongers' Diary and Text Book*, a work sold to non-subscribers at 75 cents.
By a mutual clubbing arrangement between the two journals, subscriptions to both will be received by either *The Ironmonger* or *The Iron Age* on the following terms:

THE IRONMONGER and THE IRON AGE, Weekly.
In the United States and Canada.....\$7.50 or £1.10s | In Great Britain and Ireland.....\$5.50 or £1.2s | In other countries.....\$8.00 or £1.12s
THE IRONMONGER, Weekly, and THE IRON AGE, Monthly.
In the United States and Canada.....\$5.75 or 23s | In Great Britain and Ireland.....\$3.25 or 13s | In other countries.....\$5.75 or 23s

ADVERTISEMENTS

are inserted in the *Ironmonger and Metal Trades' Advertiser* at the subjoined rates, from which no variation can be made on any ground whatever.

Size of Page—Nine Inches Deep by Six Inches Wide.

One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in the *Ironmongers' Diary and Text Book*, published toward the end of each year, and presented to every Subscriber.

	53 INSERTIONS, each net.	27 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.	1 INSERTION net.
One page.....	\$20.00	\$22.50	\$25.00	\$30.00	\$35.00	\$50.00
Two-thirds page.....	15.00	16.90	18.75	22.50	26.25	37.50
Half page.....	11.00	12.40	13.75	16.50	19.25	27.50
One-third page.....	8.00	9.00	10.00	12.00	14.00	20.00
Quarter page.....	6.40	7.25	8.00	9.60	11.20	16.00
One-sixth page.....	4.50	5.10	5.65	6.75	7.75	11.30
One-eighth page.....	3.60	4.10	4.50	5.40	6.25	9.00
One-sixteenth page.....	2.00	2.25	2.50	3.00	3.50	5.00

SPECIAL ISSUES.

In the spring and autumn of each year there is published a special issue, the circulation of which is not less than **Twelve Thousand (12,000)** copies.

THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual, presented free to every Subscriber to the *IRONMONGER AND METAL TRADES' ADVERTISER*. It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

THE FOREIGN SUPPLEMENT,

With which is incorporated The Universal Engineer,

is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication for the next twelve months will be as follows:
APRIL 26, MAY 24, JUNE 21, JULY 19, AUGUST 16, SEPTEMBER 13, OCTOBER 11, NOVEMBER 8, DECEMBER 6, 1884, JANUARY and FEBRUARY 25, 1885.
This supplement is published in

FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach, but in the native language of eighty millions of German, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.
Advertisements are inserted in any language at the following

MODERATE TARIFF.

Size of Page—13½ Inches Deep by 9¼ Inches Wide.

	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.		13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.
One page.....	\$30.00	\$33.75	\$37.50	Quarter page.....	\$10.00	\$11.25	\$12.50
Two-thirds page.....	22.00	24.75	27.50	One-sixth page.....	7.50	8.45	9.40
Half page.....	17.00	19.15	21.25	One-eighth page.....	6.20	7.00	7.75
One-third page.....	12.50	14.10	15.65	One-sixteenth page.....	3.20	3.40	4.00

Advertisers will do well to use illustrations freely. Where economy of space is an object, a left page illustrated and described in one language can be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE,

so far as our experience of more than twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the *Ironmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity, not to be compared with any of the other ordinary channels of communication.

NICKEL PLATING.

(FIRST HANDS IN ALL THESE GOODS.)

MANUFACTURES:

Pure Nickel Anodes,
Pure Nickel Salts,
Gold Salts,
Silver Salts,
Copper Salts,
Brass Salts,
and Solutions.

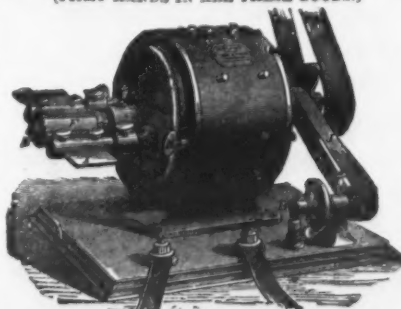
Cyanide Potash,
Nickel, Silver,
and Other Batteries.

MANUFACTURES:

Best Nickel and Silver
Rouge,
Crocus Composition,
Tripoli Composition.

IMPORTERS

Vienna Lime,
Pumice Stone,
Sea Horse,
Felt Wheels,
Polishing Buffs,
Polishing Brushes.



WESTON DYNAMO-ELECTRIC MACHINE

For Nickel, Bronze, Brass, Copper and Silver Plating.

A greater number in use than all others combined.

HANSON, VAN WINKLE & CO.,
Newark, N. J. New York Office, 92 Liberty St.

CATALOGUES AND PRICES ON APPLICATION.

UPWARD FILTERS!

Self-Cleansing.

No Repacking.

THE MOST

EFFICIENT,

DURABLE,

ORNAMENTAL,

SALEABLE

AND

THE BEST FILTERS

in the market are
manufactured by

STYLE H.

THE STEVENS FILTER CO., OHIO.

Liberal discount to the Trade. Send for prices.

IMPERIAL PORCELAIN COOLERS.

Series D.

Entirely New in Shape, Shades
and Decorations.

Six Sizes and Six Shades.

Guaranteed to Hold the
Quantity Specified.

SEND FOR SPRING CATALOGUE.

**GEO. D. WINCHELL
MFG. CO.,**

Cor. Bank & Riddle Streets,
CINCINNATI, OHIO.



MERCHANT & CO.,
525 ARCH STREET, Philadelphia. 90 BECKMAN STREET, New York.

ELECTRICAL COPPER WIRE,

BARE AND INSULATED, FOR

Magnets, Office Wire, Annunciators, Electric
Lights, Telephone, Telegraph, &c.

BATTERY COPPER, STRIP, RODS, &c. ZINC PLATES AND RODS,
SEAMLESS BRASS AND COPPER TUBING.

CROWN WATER METER.

ADOPTED BY THE

DEPARTMENT OF PUBLIC WORKS,
NEW YORK CITY.

National Meter Co.,

JOHN C. KELLEY, President,

No. 51 Chambers St., NEW YORK.

WROUGHT IRON TACKLE BLOCKS.

Swivel Hooks for Rope or Chain,
POLISHED GROOVES, ALL SIZES IN STOCK.

Also Pulley Blocks for Wire Rope,
Headquarters for the

IRVING BRAND WOODEN PULLEY BLOCKS,

MCCOY & SANDERS, Manufacturers,
26 Warren Street, New York.



THE **CINCINNATI CORRUGATING CO.,**
CINCINNATI, OHIO.

CORRUGATED SHEET IRON.
MANUFACTURERS OF Superior Corrugated
Roofing, Siding, Cell-
ing, Arches, Lath,
Etc.
For Rolling
Mills, Blast Furnaces,
Foundries, Machine
Shops, Car Shops, Boiler
and Engine Rooms, Etc.
Steel and ZINC.
Fire, Water and Wind Proof. Light, Cheap and Durable.
Send for Descriptive Illustrated Catalogue.

J. M. STUTZMAN,
181 William Street, NEW YORK.

STEEL NAME STAMPS.

Steel Alphabets,
BRANDS, SEALS,
POSTMARKERS,
Door Plates.

Steel Stencil-Cutting Dies, Soap Moulds and Brass Stamps.
SEND FOR PRICE LIST.

HAIGHT & CLARK,
ALBANY, N. Y.,
MANUFACTURERS OF FINE GRAY IRON CASTINGS,
ORNAMENTAL AND ART CASTINGS
OF EVERY DESCRIPTION.

Rosettes and Pickets for Wire Workers. Castings for Furniture and Piano Manufacturers. Sieve and
Metal Patterns of all kinds a specialty. Correspondence solicited.
JAPANNING. NICKEL PLATING. BRONZING.

JOHN T. LEWIS & BROS.,
No. 231 South Front St.,
PHILADELPHIA.



TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS.

JOHN JEWETT & SONS
Manufacturers of the well-known brand of
WHITE LEAD.



TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

181 Front Street, NEW YORK.



The Atlantic White Lead and
Linseed Oil Co.,
Manufacturers of

White Lead (Atlantic), Red Lead, Lith-
arge, Glass Makers' Litharge and
Orange Mineral;
LINSEED OIL.

Raw, Refined and Balled.

ROBERT COLGATE & CO.,
287 Pearl St., NEW YORK.

SALEM LEAD COMPANY,
CORRODERS AND MANUFACTURERS OF

PURE WHITE LEAD.

ALSO MANUFACTURERS OF

Lead Pipe and Narrow Sheet Lead.

SALEM, MASS.

F. A. BROWN, Treas.

FOX'S
CORRUGATED BOILER FURNACES.



1. They are made of a single steel plate, welded at the bottom, with no joint in contact with the flame.
2. They give 50 per cent. more evaporative power.
3. They throw off all scale by their elasticity.
4. They do not destroy themselves by the variation of temperature, contracting and expanding as they do like an accordion. They have not enough stiffness to work against the boiler heads.
5. They require, to comply with the rules of the Board of Trade in England, only one-half the thickness of plate of plain furnaces for equal working pressure.
6. Where a plain furnace of equal length, diameter and thickness collapsed at 225 pounds, the Corrugated stood 1000 pounds per square inch.

Since five years 700 steamers were fitted with these furnaces, among them the Alaska, Oregon, City of Rome, Servia, Elbe, Werra, Fulda, &c. Perfect safety and greatest economy combined. For particulars, apply to

Hartmann, Le Doux & Maecker,
134 PEARL ST., NEW YORK,
Sole Agents and Assignees of U. S. Patents.



Prouty's Patent PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

It will throw a continuous jet FROM
FORTY TO SIXTY FEET. A new pattern
jet and spray nozzle is sent with each
pump.

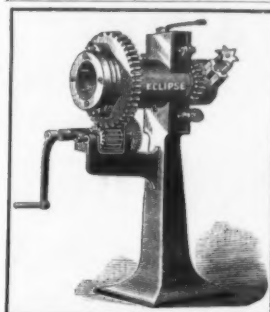
Especially attention is called to the
material and workmanship exhibited
in these pumps.

LIST PRICE, \$8.

THE NEW ENGLAND BUTT CO.

PROVIDENCE, R. I.

NEW YORK OFFICE, 99 Chambers St.



THE "ECLIPSE"

HAND

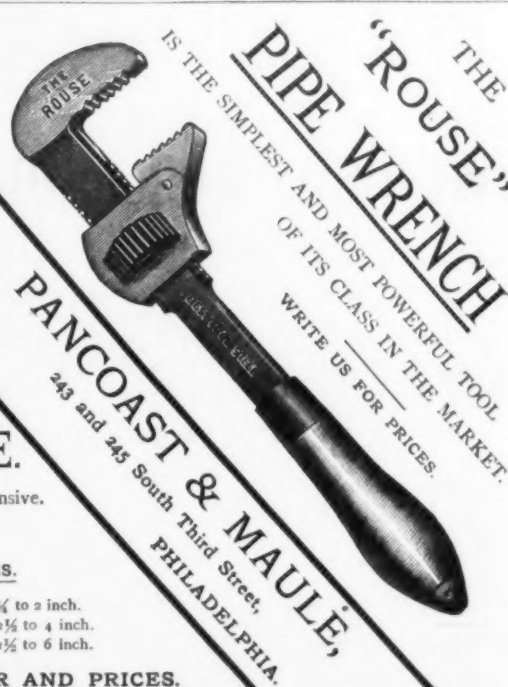
PIPE MACHINE.

Simple, powerful, portable, inexpensive.
With it one man can easily
cut 6-inch Pipe.

MADE IN THREE SIZES.

No. 1.—CUTS AND THREADS $\frac{1}{4}$ to 2 inch.
No. 2.—CUTS AND THREADS $\frac{3}{8}$ to 4 inch.
No. 3.—CUTS AND THREADS $\frac{1}{2}$ to 6 inch.

SEND FOR CIRCULAR AND PRICES.



Gentlemen.—This cut illustrates our CAST IRON Furnace Lamps

which are superseding entirely the Tin Lamps
wherever introduced, in consequence of their du-
rability. They are now extensively used in the
Iron Districts of Ohio and some in Pennsylvania.
We call your attention to and solicit your order
for them, confidently asserting that they are an
A No. 1 article in every respect.



Sample sent if desired.
PRICE, \$12 PER DOZEN.

The Taylor & Boggis F'dry Co.,
CLEVELAND, O.

V. G. HUNDLEY,
PROPRIETOR OF
NORTH CAROLINA HANDLE CO.



MANUFACTURER OF
Handles and Spokes,
79 Reade Street and 97 Chambers Street, NEW YORK
WAREHOUSE COMMISSION MERCHANT.

SHEET-IRON BUILDING MATERIALS.

ROOFING.
SIDING.
CEILING.

Patent Cap Seam Roofing, in Four Styles. In Sheets
or Rolls.
Crimped Iron, for Siding or Roofing for Elevators,
Mills and Factories.
Paneled and Crimped Iron Ceiling. Durable, Attractive,
Fire-proof.

Send for Prices and Circulars to

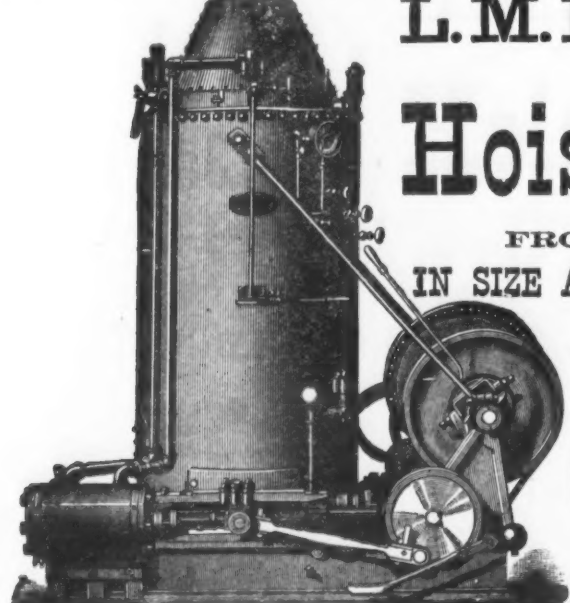
A. NORTHROP & CO., 97 First Ave., PITTSBURGH.

L. M. RUMSEY MFG. CO.
ST. LOUIS, MO.

Hoisting Engines

FROM 4 TO 50 HORSE POWER,
IN SIZE AND STYLE TO SUIT REQUIREMENTS.

SPECIAL COAL-HOISTING ENGINES
DOUBLE-CYLINDER MINING ENGINES,
ENGINES AND BOILERS
Pumping Machinery,
MINING AND ENGINEERS' SUPPLIES.



UNION STONE COMPANY
38 and 40 Hawley Street, BOSTON, MASS.,

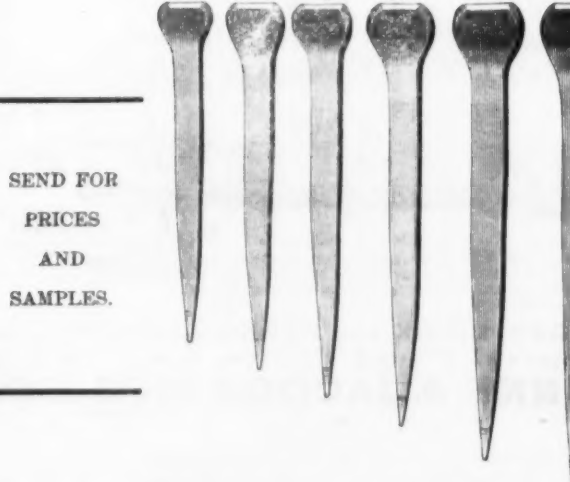
Patentees and
Manufacturers
OF THE



Union Emery Wheel.
Emery Wheel Machinery and Tools a Specialty; Automatic Knife Grinding Machines, Wood Polishing Wheels, Emery, Quartz, Corundum, Grinders' and Polishers' Supplies. Catalogue on application.

New Haven Horse Nail Co.,
NEW HAVEN, CONNECTICUT.


SEND FOR
PRICES
AND
SAMPLES.



HOT
FORGED
AND
HAMMER
POINTED

RUNYON & HALLETT,
REPRESENTATIVES,
103 Chambers Street, New York.

BROWN & SHARPE MFG. CO.



STOCKS CARRIED AT
THEIR WORKS
IN PROVIDENCE, AND
WITH THEIR
APPOINTED AGENTS
THROUGHOUT
THE COUNTRY.

The York Pat. Steel Scraper



Patented December 27th, 1881.
Runners Patented February 11th, 1884.

The Lightest and Strongest Scraper made. The body is made of one single piece of steel. The handles are fastened inside of fold, and free from all obstructions. The body, ball and runners are all made of steel. Especially suited for contractors. Send for circulars. Manufactured by

THE YORK MFG. CO. Limited Portsmouth Ohio.

CHAMPION HOG RINGER
RINGS AND HOLDER.
Only double ring ever invented. The only ring that will effectually keep hogs from rooting. No sharp points in the nose.



EAGLE BILL CORN HUSKER
Is the best Husker in the market. Farmers say it is the best. Use no other.



Ringers, 750. Rings, 500. Holders, 750. Huskers, 150.
CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

THE REIHER SELF-LOCKING IMPROVED TRANSOM LIFTER

A represents the Stationary Locking Bar; B the Self-Locking Adjusting Block; C the Operating Rod; D the Lower Bracket; E the Lifting Arm; F the Transom Bracket.



With this Adjustable Locking Bar and Lifting Arm, the opening of the transom can be made larger or smaller without the least inconvenience.

Regular Sizes of Lifters for the Trade: 1/4 in., 5/16 in. and 3/8 in.

Duplicates of Arm E, in different lengths, furnished with first order.

Catalogues furnished on application.

F. A. REIHER & CO.,
EXCLUSIVE MANUFACTURERS
Nos. 11 & 13 South Canal St.,
CHICAGO ILL.

THE WOODRUFF PATENT CELEBRATED AMERICAN SUSPENDING EAVE TROUGH HANGER.
The best in the world. Manufactured by GEO. W. HEARTLEY, 301 St. Clair St., Toledo, Ohio. Send for prices.



FLORENCE TACK CO.,
FLORENCE, MASS.,
MANUFACTURERS OF EVERY VARIETY OF
TACKS AND SMALL NAILS.
GOODS MADE TO SAMPLE.
Also, Fine Swedes Iron Tacks for Upholsters and Trimmers' use.

IRON AND BRASS RIVETS, ESCUTCHEON PINS, HEADLESS SCREWS, &c.,
FOR MANUFACTURERS OF HARDWARE.
Also Thumb Screws, Studs and Special Brass Work for Electrical Supply Manufacturers.

THE CORNWALL & PATTERSON MFG. CO.,
BRIDGEPORT, CONN.


THE DUPLEX INJECTOR.
SIMPLE,
RELIABLE
AND
DURABLE.



The constantly increasing sales of this Injector attests its superiority as a Boiler Feeder.

Manufactured by
JAMES JENKS,
48, 50, 52 and 54 Randolph St.,
DETROIT, MICH.

J. POPPING'S
Patent Machine and Tool Works,
Manufacturer of



PATENT WILLOW AND RATTAN SPLITTING AND PLANING MACHINES, SOLID IRON SHOULDER RABBIT AND ENGLISH BULL NOSE PLANES, ETC.

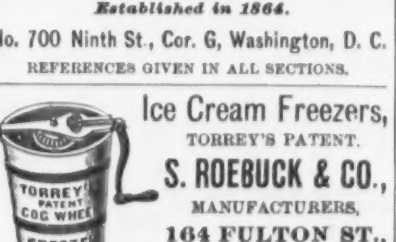
N. E. Cor. 58th St. and 11th Ave., New York.

SEAMLESS TUBES.



W. C. DODGE. W. W. DODGE.
DODGE & SON,
Attorneys & Solicitors of Patents
Established in 1864.

Ice Cream Freezers,
TORREY'S PATENT.
S. ROEBUCK & CO.,
MANUFACTURERS,
164 FULTON ST.,
NEW YORK.

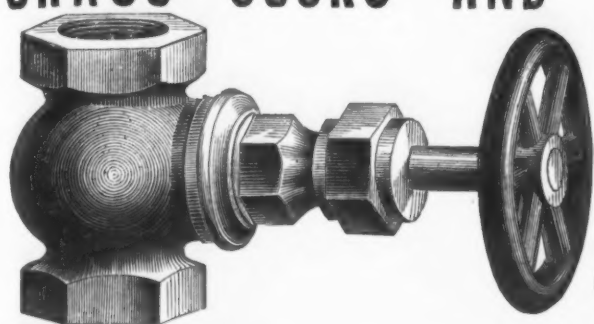


Cutlery.—Pocket American Shear Co's.....	dis 40 5
Butcher Knives Wood's, Lap Solider.....	dis 40 5
Square Handle.....	dis 40 5
Stank Knives.....	dis 40 5
Lap Solider, Oval Handle.....	dis 40 5
Slicing.....	dis 40 5
Butcher, Common Round Hand, Wood's.....	dis 40 5
Shoe Knives, Wood's.....	dis 40 5
Dividers.—Cook's.....	dis 25 5
Doors.—Torrey's.....	dis 25 5
Imitation Torrey's Rod.....	dis 1 1/2
Gen. Coll. new list.....	dis 40 5
Crown.....	dis 1 1/2
Warner's.....	dis 2 00
Door Stops.—Thurston's.....	dis 40 5
Drawer Knobs.—Thurston's.....	dis 40 5
Drills.—Morse Bitt Stock.....	dis 40 5
Morse Straight Shank.....	dis 40 5
Emery.—Wellington Mills.....	dis 100
Walpole Emery Mills.....	dis 100
Turkish in 10 cans.....	dis 100
Enamelled Ware.—	
Standard Mfr. Co. Kettles.....	dis 40 5
Standard Sauce Pans.....	dis 40 5
Felice Plates.—Wrought.....	dis 40 5
Files.—American File Co's.....	dis 40 5
Nicholson File Co's.....	dis 40 5
Fluting Machines.—Knox list.....	dis 25 5
Forke.—W. C. & Co. Manure.....	dis 40 5
Eastern Tool Co's, Manure.....	dis 40 5
Gimlet Bits.—	
Genuine German, No. 125, 1 1/2 to 2-3/4, per doz.....	dis 100
Pierce's.....	dis 100
Glass Cutters.—Combination Glass Cutter and	
Knife Sharpener.....	dis 100
Grab Hoes.—K. F. & Co's No. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS AND VALVES,



For STEAM, WATER, and GAS. Wrought Iron Pipe and Fittings, PLUMBERS' MATERIALS.

Factory, Paterson, N. J.

56 John Street, N. Y.

Our new Illustrated Catalogue and Price List is now ready, and will be sent to the trade with their first order, or by express, if desired, before ordering.

8oz. 10oz. 12oz. 1lb. 1 1/2lb. 2lb. 2 1/2lb. 3lb. 4lb. 5lb. 6lb. 7lb. 8lb. 10lb. 12lb.

COUNTERSUNK HEAD. ROUND HEAD. FLAT HEAD. STEEP HEAD. WAGON BOX HEAD. CONE HEAD. ROSE HEAD. TRUSS HEAD.

RIVETS

OF EVERY DESCRIPTION, FIRST QUALITY.

W.P. TOWNSEND & CO.

NEW BRIGHTON, PA.

5lb. 6lb. 7lb. 8lb. 10lb. 12lb.

H. B. NEWHALL CO. 105 Chambers Street New York Agents.

Wm. H. Haskell, President.

E. S. Mason, Treasurer.

D. A. Hunt, Agent.

WM. H. HASKELL CO.,

MANUFACTURERS OF

GIMLET POINT

COACH SCREWS



Bolts, Cold-Punched Nuts & Washers, SUITABLE FOR MACHINERY OF ALL KINDS.

Office and Works: 277 Main St., PAWTUCKET, R. I., U. S. A.

HENRY B. NEWHALL CO., Agents,

105 Chambers St., New York.

47 Pearl St., Boston.

STANDARD NUT CO.,

Pittsburgh, Pa.,

MANUFACTURERS OF

HOT PRESSED

Square & Hexagon Nuts,

R. R. FISH BARS,

BOLTS.

SPIKES.

RIVETS, &c.

Philadelphia "STAR" Bolt Works.

NORWAY IRON

FANCY HEAD BOLTS,

Carriage & Tire Bolts.

Star Axle Clips, &c.

TOWNSEND, WILSON & HUBBARD, 2301 Cherry Street, Philadelphia, Pa.

G. W. Bradley's Edge Tools.

Butchers' Cleavers, Butchers' Choppers, Axes and Hatchets, Grub Hoes and Mattocks, Mill Picks, Box Chisels and Scrapers,

Ring Bush Hooks, Ax Eye Bush Hooks, Socket Bush Hooks, Watt's Ship Carpenters' Tools, Carpenters' Drawing Knives, Coopers' and Turpentine Tools.

FOR SALE BY

MARTIN DOSCHER, Agent, 85 Chambers Street, N. Y.

BLAKE

CRUSHER CO.,

New Haven, Conn.



BLAKE'S Challenge Rock Breakers.

Patented Nov. 18, 1879.

See The Iron Age first issue of the month.

EATON, COLE & BURNHAM CO.,

58 John St., NEW YORK.

Factory at BRIDGEPORT, CT.

MANUFACTURERS OF

Fittings, Valves, Tools,

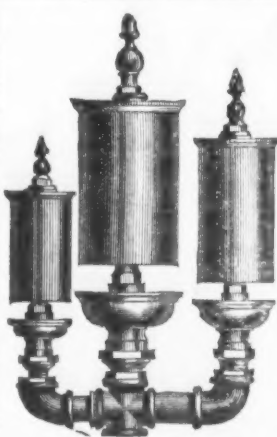
AND ALL STYLES OF

Goods for Steam, Water, and Gas, Wrought Iron Pipe, &c.

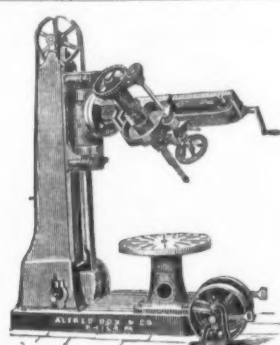
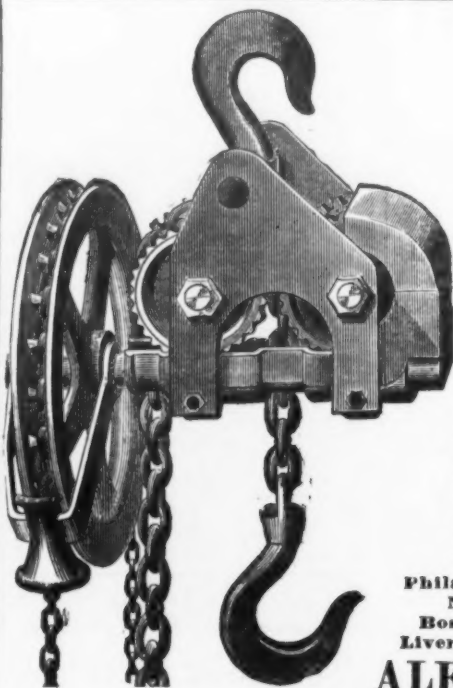
Agents for BUNDY'S RADIATORS.

Manufacturers of

DEANE'S PATENT SOLID STOCKS AND DIES.



WHISTLE CHIMES TO ORDER.



BOX'S PATENT RADIAL DRILLS

Box's Patent Double-Screw Hoists.

12,000 Hoists sold. Orders continually renewed prove conclusively their superiority above all others. A liberal discount to the trade.

Elevators, Cranes, Radial Drills

—AND—

SPECIAL HOISTING MACHINERY.

Send for 1884 Illustrated Circular.

Philadelphia Office, 314 Green Street.

New York, 96 Liberty Street.

Boston, 1176 Tremont Street, and

Liverpool, England, No. 1 Hall Lane.

ALFRED BOX & CO.

Jarecki's Screw Plate and Pipe Cutter.

WRITE FOR DISCOUNT AND DESCRIPTION.



No. 1 Cuts off and Threads 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100.

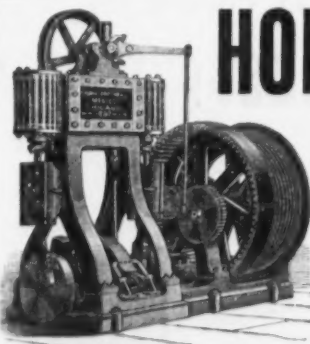
No. 4 Cuts off and Threads 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100.

JARECKI MANUF'G CO., ERIE, PA.,

MANUFACTURERS OF

Malleable and Cast-Iron Pipe Fittings, Brass and Iron Valves and Cocks for Steam, Gas, Water and Oil; Pumps, Machinery and Supplies for Artesian Wells.

ILLUSTRATED CATALOGUE ON APPLICATION.



HOISTING ENGINES

FOR Blast Furnaces, Coal and Iron Mines.

CRANE BROS.' MFG. CO.

CHICAGO WORKS:

No. 10 N. Jefferson Street.

NEW YORK OFFICE:

92 & 94 Liberty Street.

OTIS HOISTING ENGINES.

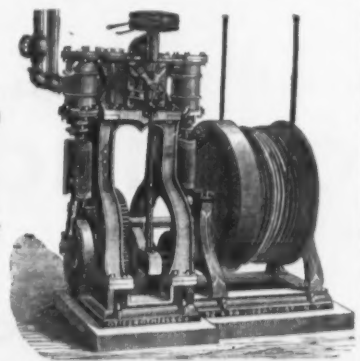
Standard, Hydraulic and Steam

ELEVATORS

have been before the public for over a quarter of a Century and are now used throughout the World.

OTIS BROTHERS & CO.,

92 & 94 Liberty St., New York,



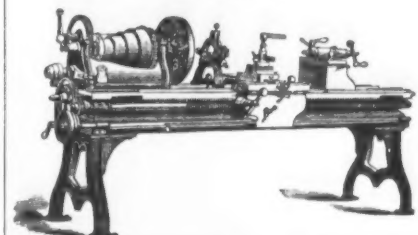
THE GREATEST ROCK BREAKER ON EARTH. CAPACITY 1 TON A MINUTE. GATES IRON WORKS. 50-52 SCANAL ST. CHICAGO.

SEND FOR CIRCULARS



P. BLAISDELL & CO.,

Manufacturers of



MACHINISTS' TOOLS,

Blaisdell's Patent Upright Drills,

With Quick Return Motion.

Engine Lathes, Planers, Boring Mills, Gear Cutters and Hand Lathes.

WORCESTER, MASS., U. S. A.

THE MILLER CO.

CANTON, OHIO,

Manufacturers of

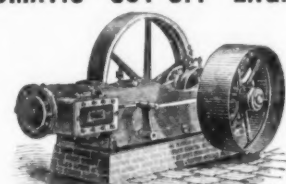


Ohio Farm, Church, School and Factory BELLS. Also very superior strong, soft and clean CASTINGS. If you have failed to get difficult pieces elsewhere give us a trial.

SOLE MANUFACTURERS OF THE

Torrent and Unique Steam Pumps.

AUTOMATIC CUT-OFF ENGINES

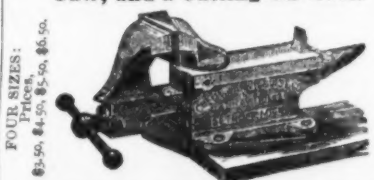


Embodying new system of regulation. The Governor Weighs the Load. The most perfect governing ever obtained. Send for Circular B.

BALL ENGINE CO.,

ERIE, PA.

An Anvil; A Vise, with Adjustable Jaw, and a Cutting-Off Tool.



For Descriptive Circulars and Trade Discount, address CHENEY ANVIL AND VISE CO., Detroit, Mich.

HOLT'S FORGES.

FIVE SIZES.

FOR ALL KINDS OF WORK.

\$10 and Upward.

Send for circulars.

HOLT MFG. CO.,

Cleveland, Ohio.

THE "EDDY" STRAIGHTWAY VALVES.

AND FIRE HYDRANTS.

The EDDY VALVE COMPANY

WATERFORD, N. Y.

AGENTS IN ALL PRINCIPAL CITIES.

Send for Price List.

MACHINERY FOR Straightening & Cutting Wire Of all Sizes to any Length. Send for Catalogue.

J. N. O. ADT & SON,

New Haven, Conn., U. S. A.

HOWARD IRON WORKS,

BUFFALO, N. Y.,

Manufacturers of

BOLT CUTTERS

AND NUT TAPPING MACHINES,

(Schlenker's Patent).

Send for Illustrated Catalogue.

PITTSBURGH MFG. CO.,

MANUFACTURERS OF

Nail and Spike Machines, BOLTS, NUTS, WASHERS,

RIVETS, &c.

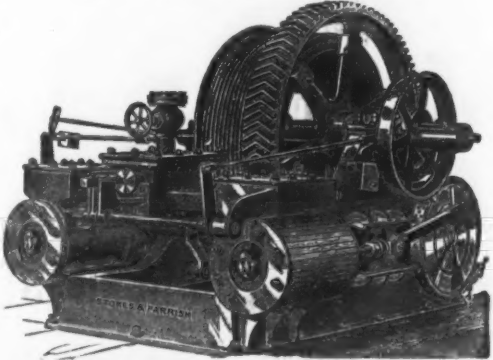
Castings, Forgings and Blacksmith Work promptly attended to.

OFFICE AND WORKS,

RAILROAD STREET, NEAR 28th, PITTSBURGH, PA.

STOKES & PARRISH,
PHILADELPHIA.**ELEVATORS,**

Passenger and
Freight, Steam,
Hydraulic and
Belt Power.

**HOISTING
MACHINERY**

For Mines, Dock
Use and Inclined
Planes.

All kinds of
Hoisting Machin-
ery a Specialty.

BLAST FURNACE HOISTING ENGINES,

With Vertical or Horizontal Cylinders, for Handling Stock to Top of Stack with One or Two Platforms.

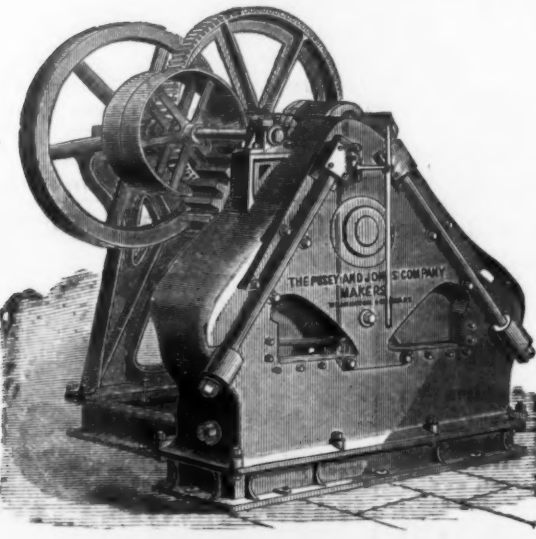
WORKS AND OFFICE,
3001 Chestnut St., Phila.

NEW YORK OFFICE,
95 and 97 Liberty St.

THE PUSEY & JONES COMPANY,

WILMINGTON, DELAWARE,

BUILDERS OF

**STEAM ENGINES,**

Boilers, Tanks,
MACHINERY FOR ROLL-
ING MILLS,

Punches, Shears,

Machines for Cutting off and
Slitting old Railroad Rails pre-
vious to being piled in Rolling
Mills.

Steam Riveting Machines

Applicable to Bridge Builders' Work.

RIGHT AND LEFT ANGLE
IRON CUTTERS,

Hydraulic Bending
Machines,

AND HEAVY MACHINERY
GENERALLY.

POWER TRANSMITTING MACHINERY.

SHAFTING, HANGERS,

PULLEYS,

COUPLINGS,

CRANES

AND
MACHINE MOLDED

GEARS

A SPECIALTY.

THE WALKER MFG. CO.,

CLEVELAND, OHIO.

BAGNALL & LOUD,

BOSTON, MASS.

Sole Manufacturers in U. S. A. of our
Celebrated

METALINE

Improved Sleeve Roller

Bush Tackle Blocks.

Also a full line of every variety of
TACKLE BLOCKS.

Try Us with a Sample Order.

Send for Illustrated Catalogue.

New York Warehouse, 33 South Street.

Western Agency: GURNEY & PHALEN, 247 Lake St., CHICAGO.

Ludlow Valve Mfg. Co.

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vall Ave., Troy, N. Y.

VALVES.

Double and Single Gate, 1/2 in. to 48 in.—outside and inside Screws, Indicator, &c.
for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

DROP FORGINGS

Of Every Description a Specialty.

ADDRESS,

R. H. BROWN & CO.,

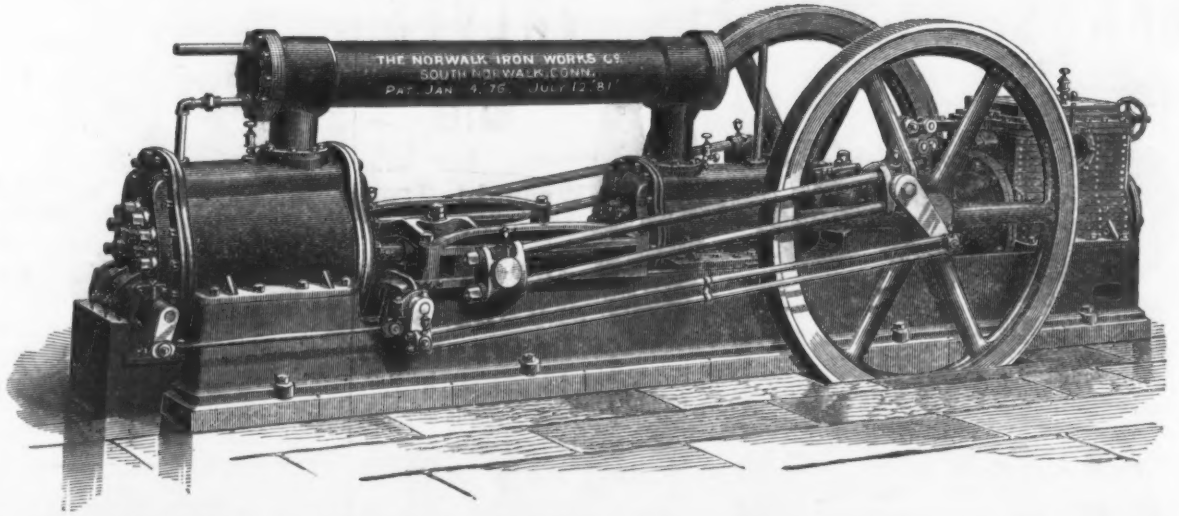
NEW HAVEN, CONN.

Also Manufacturers of

W. A. CLARK'S PATENT EXPANSIVE BIT,

CLARK'S PATENT HANDLE SCREW DRIVER,

And Other Specialties in Hardware Line.

Air Compressors.

THE NORWALK IRON WORKS CO., South Norwalk, Conn.

E.W. BLISS
PRESSES & DIES.

FINE ENGINE LATHES AND SHAPERS.

SPECIAL MACHINERY FOR TIN & SHEET

METAL WORKERS

PLYMOUTH, PEARL

& JOHN ST.'S. BROOKLYN, N.Y.

HOLBROOK, MERRILL & STETSON, AGENTS
SAN FRANCISCO, CALIFORNIA.

MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,
Beach's Patent Self-Centering Chuck, Solid and Shell Reamers

BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL
PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER
AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS
DRILL GRINDING MACHINES. TAPER REAMERS, MILLING
CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt.

EDWARD S. TABER, Treas.

MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S



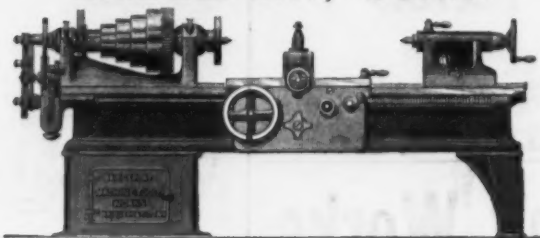
Manufacture of Patent Machine Relieved Nut, Hand,
Blacksmith and Machine Screw Taps, Screw Plates, Tap
Wrenches and Patent Relieved Pipe Taps and
Pipe Reamers; also of Solid Bolt and Pipe Die,
Furnished in V. U. S. Standard and Whitworth
shape of threads.

111 Liberty Street.

NEW YORK

Bridgeport Machine Tool Works.

BRIDGEPORT, CONN.



SPECIALTY:

Extra Heavy 16 and 21 in. Lathes.

E. P. BULLARD, Proprietor, - - 14 Dey Street, New York.

FITTINGS. Malleable and Gray Iron, All Kinds
STAR MACHINE WORKS. Write for Prices.
Cleveland, O.**MARTIN REYNOLDS,**

354 Lorimer St., Brooklyn, E. D.,

Brass Smelter & Refiner.

Ingot Brass for Car Bearings a specialty.

Brass washings for bell makers always on hand.

**CLAY PIGEONS
AND TRAPS.**

WHOLESALE ONLY. AGENTS WANTED.

ADDRESS, FOR THE

CLAY PIGEON COMPANY,

B. KITTREDGE & CO.,

166 Main Street, CINCINNATI, OHIO.

DETROIT LUBRICATOR CO.'S

PATENT SIGHT FEED

LUBRICATOR CUPS,

For oiling valves and cylin-
ders of steam engines by the
only perfect method.

Through the Steam Pipe.

The oil passes in right, drop
by drop, into the column of
steam, where it atomizes,

thus becoming a fine mist,
every part reached by the
steam. Saves from 50 to 60
per cent in oil and wear of
machinery, thus paying for
itself several times a year.

A cup will be sent to re-
sponsible parties on 25 days'
trial if desired. If we re-
fer to more than 10,000 firms
using them. Address

DETROIT LUBRICATOR CO.,

Office, 125 Griswold St.,

Detroit, Mich.

Illustration of a lubricator cup.

"CLAYTON"

IMPROVED

MINING PUMPS

ROCK DRILLS.

Illustration of a mining pump.

AIR COMPRESSORS

For CATALOGUES, ESTIMATES, Etc. Address

CLAYTON STEAM PUMP WORKS

45 & 47 York St., BROOKLYN, N.Y.

(Near Approach to New York & Brooklyn Bridge.)

RIVAL

STEAM PUMPS

CHEAPEST AND THE BEST

FOR HOT & COLD WATER.

\$35.00 UPWARDS.

IS SIZES

MANUFACTURED BY

JOHN H. MCGOWAN & CO.

CINCINNATI

Illustration of a steam pump.

DEAD-STROKE POWER HAMMERS.

CONSTRUCTION IMPROVED.

Seven Sizes.

5 to 250 Pounds.

Prices Reduced.

Illustration of a power hammer.

DIENELT & EISENHARDT,

MAKERS,

1310 Howard St., Philadelphia.

ESTABLISHED 1855.

BEECHER & PECK,

MANUFACTURERS OF

PECK'S PATENT

DROP PRESS,

Blast Forges, Steel

and Iron Drop

Forgings.

C. E. LLOYD & RIVER STS.,

NEW HAVEN, CONN.

Illustration of a drop press.

A. H. MERRIMAN,

Meriden, Conn.,

Manufacturer of all Descriptions of

PRESSES.

Catalogue and prices sent on application.

Illustration of a press.

PITTSBURGH BELLOWS WORKS.

WM. FLACCUS & SON,

PITTSBURGH, PA.,

Manufacture Every Variety and All Sizes of

BLACKSMITH BELLOWS.

Superior Quality, covered with own make best

Oak-Tanned Leather.

Illustration of a bellows.

Machinery, &c.

LYON'S HAND OR POWER PUNCHES AND SHEARS.

For Round, Flat or Square Iron,
Polishing & Buffing Machinery,
HYDRAULIC JACKS,
To raise from 2 to 120 tons.
Hydraulic Presses for Special & General Use.
HYDRAULIC HAND & POWER PUMPS
with 1 to 6 plungers, to run hydraulic presses, with
either uniform or changeable speed.
Second-hand Presses.
WATSON & STILLMAN,
(Successors to E. LYON & CO.)
470 B Grand Street, NEW YORK.
Send for circular of what you want.



THE MACKENZIE PATENT
CUPOLA & BLOWER.

Send for circular to
Smith & Sayre Mfg. Co.,
PROPRIETORS, 245 Broadway, New York.
This Cupola has made a great revolution in melting iron. It differs from all others in having a continuous tuyere, or in other words, the blast enters the fuel at all points. Above one ton capacity per hour, they are made oval in form. This brings the blast to the center of the furnace with the least resistance and smallest possible amount of power, and in combination with the continuous tuyere causes complete diffusion of the air throughout the furnace, and uniform temperature, melting ten or fifteen tons an hour with the pressure of blast required to melt two or three tons in an ordinary Cupola. It also enables us to save very largely in time and fuel, the experience of our customers showing a gain of twenty-five to fifty per cent. in time, and twenty-five to forty per cent. fuel over the ordinary Cupola, and a better quality of casting, especially in light work. This is due to the thorough diffusion of the air and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting. We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers denoting the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 20 tons. We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.



NEW OTTO SILENT GAS ENGINE.

Working Without Boiler, Steam,
Coal, Ashes or Attendance.
Started Instantly by a Match, it gives Full
Power Immediately.
When Stopped, all Expense Cesses.
No explosions, no fires nor cinders, no gauges, no
pumps, no engineer or other attendant while run-
ning. Recommended by insurance companies.
UNSURPASSED IN EVERY RESPECT for hoist-
ing in warehouses, printing, ventilating, running
small shops, &c.
1, 2, 4, 7, 10, 15 and 25 Horse-Power. Built by
SCHLEICHER, SCHUMM & CO.,
Engineers and Machinists,
N. E. Cor. 33d & Walnut Sts., Phila'delphia.
214 Randolph St., Chicago.



STEPHEN A. MORSE. C. M. WILLIAMS. EDWIN F. MORSE.
SEND FOR CIRCULARS. **CLEM & MORSE,** LATEST PATENTED IMPROVEMENTS.
Manufacturers and Builders of
ELEVATORS,
Hoisting Machinery, Automatic Hatch Doors, &c.
413 Cherry St., PHILADELPHIA, PA. Branch Office, 108 Liberty St., NEW YORK.



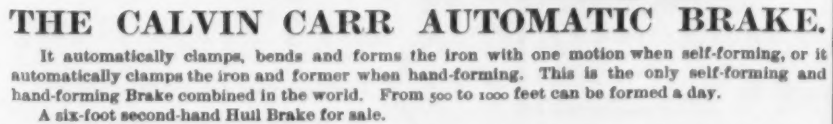
MACHINE MOLDED GEARING
From 1 to 20 feet Diameter.
SHAFTING, PULLEYS AND HANGERS
A Specialty.
POOLE & HUNT, BALTIMORE, MD.




THE CALVIN CARR AUTOMATIC BRAKE.
It automatically clamps, bends and forms the iron with one motion when self-forming, or it automatically clamps the iron and former when hand-forming. This is the only self-forming and hand-forming Brake combined in the world. From 500 to 1000 feet can be formed a day.
A six-foot second-hand Hull Brake for sale.
THE CALVIN CARR CORNICE MACHINE CO., Newark, N. J.



DRILL PRESSES.
New Upright Power Drill Presses. No. 4 swings 21 inches; back-gear, quick return. A strong iron brace extends from base to head of column—a new feature. Weight, 1100 lbs.; height, 6 feet. Price, \$210.
No. 1½, on legs, swings 15½ inches, 4 speeds. Price, \$75.
No. 1 size, to set on bench, swings 13 inches, lever feed, 3 speeds, tight and loose pulleys. Price, \$35.
Peerless Punch & Shear Co.,
38 W. Day Street, New York.



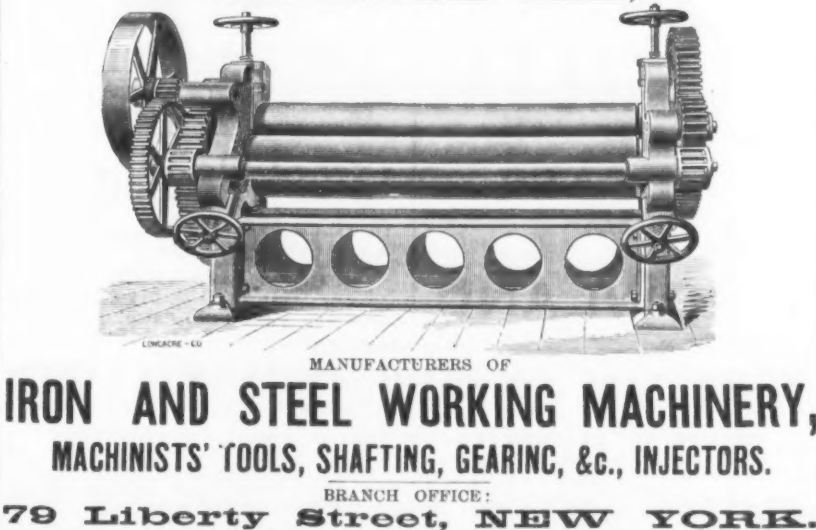
PUNCHING & SHEARING PRESSES.
Power, Foot or Hand
PUNCHES, AND SHEARS.
All sizes, from \$45 to \$1000.
Peerless Punch & Shear Co.,
38 W. Day Street, NEW YORK CITY.



Machinery, &c.

WILLIAM SELLERS & CO.,
PHILADELPHIA.

MANUFACTURERS OF
IRON AND STEEL WORKING MACHINERY,
MACHINISTS' TOOLS, SHAFTING, GEARING, &c., INJECTORS.
BRANCH OFFICE:
79 Liberty Street, NEW YORK.



SOUTHWARK FOUNDRY & MACHINE CO.,
430 Washington Ave., PHILA., PA.,
ENGINEERS AND MACHINISTS.

BLOWING ENGINES AND
HYDRAULIC MACHINERY.

SOLE MAKERS OF THE
**PORTER-ALLEN AUTOMATIC CUT-OFF
STEAM ENGINE.**

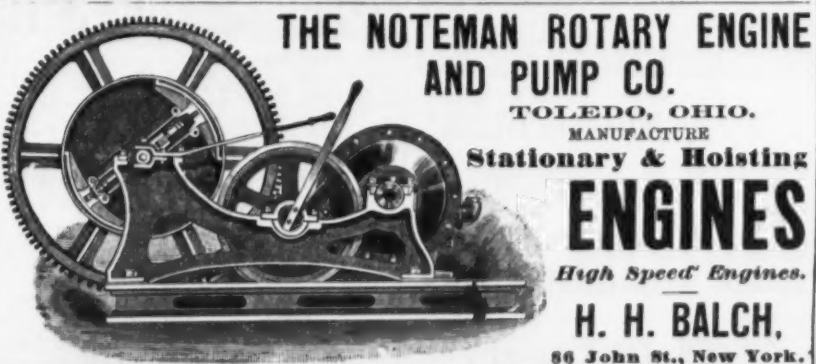
BOILERS
ABSOLUTELY SAFE FROM EXPLOSION. DRY DOCK. 18 YEARS RECORD.
CORRESPONDENCE SOLICITED.
HARRISON SAFETY BOILER WORKS.
GERMANTOWN, PA. PHILA., PENNA. GUYDON & DENTON, PHILA. PA. BARKER, NEW YORK.



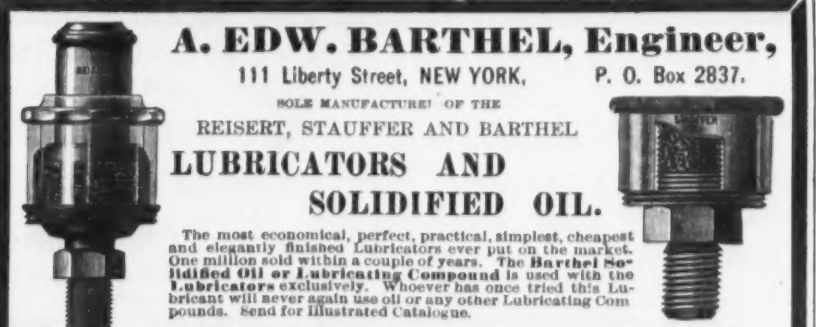
W. C. WREN'S PATENT GRATE BAR.
DAVID S. CRESWELL,
MANUFACTURER,
816 Race Street, Philadelphia, Pa.
The Most Durable Grate Bar on the Market. Send for circular and price list.



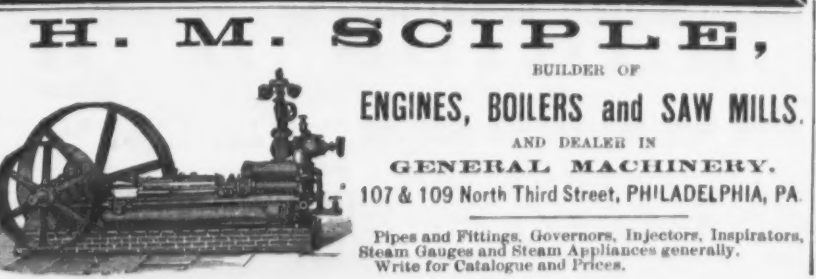
THE NOTEMAN ROTARY ENGINE AND PUMP CO.
TOLEDO, OHIO.
MANUFACTURE
Stationary & Hoisting
ENGINES
High Speed Engines.
H. H. BALCH,
86 John St., New York.



A. EDW. BARTHEL, Engineer,
111 Liberty Street, NEW YORK, P. O. Box 2837.
SOLE MANUFACTURER OF THE
REISERT, STAUFFER & BARTHEL
LUBRICATORS AND SOLIDIFIED OIL.
The most economical, perfect, practical, simplest, cheapest and elegantly finished Lubricators ever put on the market. One million sold within a couple of years. The Barthel Solidified Oil or Lubricating Compound is used with the Lubricators exclusively. Whoever has once tried this Lubricant will never again use oil or any other Lubricating Compounds. Send for Illustrated Catalogue.

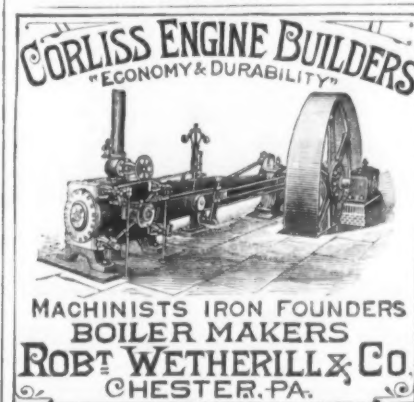


H. M. SCIPLE,
BUILDER OF
ENGINES, BOILERS and SAW MILLS.
AND DEALER IN
GENERAL MACHINERY.
107 & 109 North Third Street, PHILADELPHIA, PA.
Pipes and Fittings, Governors, Injectors, Inspirators, Steam Gauges and Steam Appliances generally. Write for Catalogue and Prices.



Machinery, &c.

CORLISS ENGINE BUILDERS
"ECONOMY & DURABILITY"
MACHINISTS IRON FOUNDERS
BOILER MAKERS
ROBT WETHERILL & Co.
CHESTER, PA.
STOW FLEXIBLE SHAFT CO., Limited,
15th & Pennsylvania Ave., PHILADELPHIA, PA.,
Manufacturers of
Portable Drilling, Tapping, Reaming and Boring Machines.
Also, Tools for Emery Wheel Grinding, Metal & Wood Polishing, Cattle Brushing & Clipping, &c.
General European Agents, BOLLING & LOWE, 2 Lawrence Pountney Hill, London, England.



CHARLES W. ERVIEN & CO.,
Engine Builders, Boiler Makers and
GENERAL MACHINISTS,
IRELAND STREET PHILADELPHIA.
PHILA. SHAFTING WORKS.
GEO. V. CRESSON
18th & Hamilton St., PHILADELPHIA.
SHAFTING A SPECIALTY
Manufacturers of
Shafting, Pulleys, Hangers, Couplings and every apparatus used in the TRANSMISSION OF STEAM POWER.




E. E. GARVIN & CO.,
Machinists and Manufacturers of
Milling Machines, Drill Presses,
HAND LATHES, TAPPING MACHINES,
CUTTER GRINDERS & WOOD PLANERS



Milling Cutters, all Shapes and Sizes. Gear Cutting and Milling in all its branches. Index Plates Drilled Accurately. Special Tools and Machinery Designed and Built to Order.
Power Milling Machine.
141 Centre St., New York. Send for Illustrated Catalogue.



E. Harrington, Son & Co.,
Established 1867.
MANUFACTURERS OF
PATENT EXTENSION AND SCREW CUTTING
LATHES
Iron Planers, Radial, Upright, Suspension Multiple and Lever
DRILLS,
and a variety of other MACHINISTS' TOOLS
Patent Double Chain Screw Pulley Blocks, Unrivaled for Durability, Safety and Power.
Patent Double Chain Quick-Lift Hoists, with Brake for quick and easy lowering.
Circulars furnished. WORKS AND OFFICE, Cor. N. 15th and Penna. Ave. Philadelphia, Pa. U. S. A. Represented by J. Q. BAYARD, 12 Cortlandt St., N. Y. C. E. KIMBALL, 101 High St., Boston. W. H. KICKER, 110 Main St., Cincinnati.



WM. McFARLAND
Iron and Brass Founder,
TRENTON, N. J.
Chilled Cast Wire Dies a Specialty.
Any size or style made at short notice.
WE CHALLENGE THE WORLD FOR ITS EQUAL. The cheapest, most durable and effective Tool for Cleaning Tubes Hot or Cold.
RUFFNER & DUNN, Schuylkill Falls, Philadelphia, Pa. Patentees and Sole Manufacturers of the EXCELSIOR STEEL TUBE CLEANER. Most liberal discount to dealers. Send for Circulars.
G. E. BRETTELL,
Furnace St., Rochester, N. Y. Planers a Specialty 26x26, 30x30 and 30x30 in. to plane 7 and 10 ft. long. SEND FOR PRICE LIST.



G. E. BRETTELL,
Furnace St., Rochester, N. Y. Planers a Specialty 26x26, 30x30 and 30x30 in. to plane 7 and 10 ft. long. SEND FOR PRICE LIST.



TUBAL SMELTING WORKS,

760 & 762 Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

GENUINE BABBITT METAL

AND ALL GRADES OF

ANTI-FRICTION METALS.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND,

PHILADELPHIA,

P. O. Address: Frankford, Philad'a.

MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform & C Springs,

"Brewster Side-Bar Combination Patented" Springs and
Timken's Patent Cross Springs,

Reiff's Patent, Groot's Patent, Carter's Patent and Saladee's Patent Crescent Springs.

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe Blister and Spring Steel.

CAST SPRING AND FLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.

BESSEMER SHOVEL AND FLOW STEEL.

BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.

NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

STEEL CASTINGS

FROM 1-4 TO 15,000 LBS. WEIGHT.
True to pattern, sound and solid, of unequalled strength, toughness and durability. An invaluable substitute for forgings, or for cast iron requiring three-fold strength. Gearing of all kinds, Shafts, Dies, Hammerheads, Crossheads for locomotives, etc. 20,000 Crank Shafts and 10,000 Gear wheels of this steel now running prove its superiority over other steel castings. CRANK SHAFTS, CROSSHEADS AND GEARING ARE SPECIALTIES. Castings of every description. Circulars and Price Lists free. Address

CHESTER STEEL CASTINGS CO.,
Works, Chester, Pa. 407 Library st., Philadelphia.

PITTSBURGH STEEL CASTING CO.,
26th and Railroad Streets, PITTSBURGH, PA.

MANUFACTURERS OF

Refined Bessemer Steel; Improved Steel Castings
Under Hainsworth's Patents.

We are now prepared to fill orders for refined BESSEMER BILLETS or BLOOMS of any desired carbon and a uniform quality.

We would call attention of consumers to the fact that we use good material, and produce a steel pronounced by competent judges equal to the best English or German spring and soft steel.

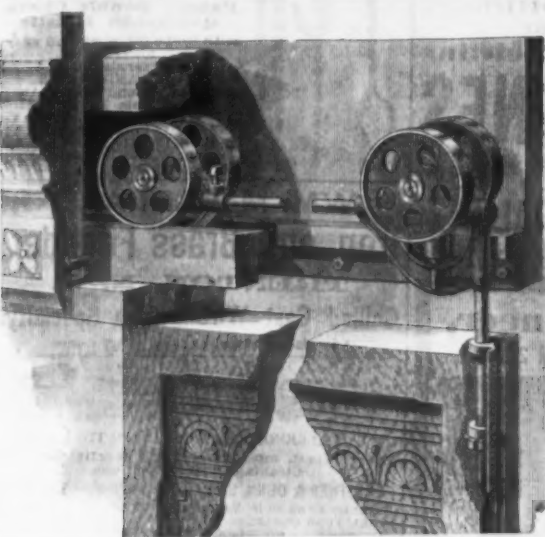
Having had twelve years' experience in the making of the United States and Canada as to the quality of our work in this line. We make castings of steel practically free from blow-holes, as soft and easily worked as wrought iron, yet stiff, strong and durable, with a tensile strength of not less than 65,000 pounds to the square inch. In short, our castings unite the qualities of steel and wrought iron.

Wheels, Pinions, Cranks, Dies, Hammer Heads, Engines and Machinery Castings of all descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landslides. Special attention given to Heavy Castings. We use no cast iron in our castings. Send for circular.



ROP HAMMERS.

Punching Presses.
DIES AND OTHER TOOLS
FOR THE MANUFACTURE OF ALL KINDS OF
SHEET METAL GOODS,
DROP FORGINGS, &c.
Stiles & Parker Press Co.,
MIDDLETOWN CONN.



NO FLANGED WHEELS.
Warner's Patent
SLIDING
DOOR HANGERS,
MANUFACTURED BY
E. C. STEARNS & CO.,
Syracuse, N. Y.
500 SETS
SOLD BY
WM. BLAIR & CO.,
Chicago, Ill.
Send for Illustrated Catalogue.



BRADLEY'S CUSHIONED HAMMER
STANDS TO-DAY
WITHOUT AN EQUAL.
Over 800 in use.
It approaches nearer the action of the smith's arm than any hammer in the world.
BRADLEY & CO.,
(Established 1832.) SYRACUSE, N. Y.

STANLEY G. FLAGG & CO.
PHILADELPHIA, PA.
Office and Works,
N. W. cor. 19th St. & Pennsylvania Ave.
Manufacturers of

STEEL CASTINGS.

A Substitute for Steel & Wrought Forgings.
Circulars sent on application.

Steel Castings.

Light and heavy Steel Castings of superior metal, solid and homogeneous. All work guaranteed. Send for circular.

EUREKA CAST STEEL CO.,
Chester, Pa.

Office: 307 Walnut St., Phila.

CRISPINS' AWL.



This is a hollow handle, with cap screwed on. It is made of hard wood, 5 inches in length and weighs 4 ounces.

It contains inside a spool of waxed linen shoe thread of best quality and 50 feet in length.

The Spool is also hollow, and contains three Awns and three Needles of various shapes and sizes. The thread fits the needles and the awls fit the chuck in the end of the handle and are held by the set screw, as seen in this cut.

This Tool is for repair work about the house, shop, farm or stable.

Being of suitable size and weight for carrying in the pocket, it can be used in the field or on the road to repair damages, when one use of it will often amount to more than its whole cost.

It will sell at sight and give great satisfaction.

Dealers who buy goods on our recommendation may always return the first lot if they desire to, and at our cost. Price, per dozen, \$3, with usual trade discount.

MILLERS FALLS CO.,

74 CHAMBERS ST., NEW YORK.

TACKLE BLOCKS.

Rope and Iron Strap of all kinds. Lignumvitae Wood for Ten-Pin Balls.

Wm. H. McMillan & Bro.,

Office, 112 South Street, New York.
Factory, 39 to 40 Penn St., Brooklyn, N. Y.



COLUMBIA BICYCLES
STANCHION
RELIABLE
Send for Catalogue
36 Page
Illustrated
THE POPE MFG. CO. 597 WASHINGTON ST.
BOSTON, MASS. TO-BE

THE BEST IN USE.

DUK'S IMPROVED ELEVATOR BUCKET

This is the only scientifically constructed bucket in the market. It is struck out from charcoal stamping iron. "No corners to catch." "No seams to burst." "No interior corners to clog up." It runs with great ease and half the power of the old style buckets. Will outwear half a dozen of them. Prices Reduced.

T. F. ROWLAND, Sole Mfr.,
BROOKLYN, N. Y.



A. G. PECK & CO.,
Cohoes, N. Y.,
MANUFACTURERS OF

AXES, ADZES,
BROAD AXES,
HATCHETS.

Send for Catalogue and Price List.

Scranton Brass and File Works.

J. M. EVERHART,

Manufacturer of

BRASS WORK,

For Water, Gas & Steam.

Exhaust Steam Injector, using waste steam only, returning it to boiler with water at 100 degrees.

Also, PATENT CUT FILES.

SCRANTON, PA.

BLACKSMITH DRILLS.

CLARK SINTZ & CO.

SPRINGFIELD, OHIO.

RUSSELL, BURDSALL & WARD,
PORTCHESTER, N. Y.,
MANUFACTURERS OF

CARRIAGE, TIRE, BOLTS, PLOW, STOVE, &c.

Carriage Bolts made from Best Square Iron a Specialty.

JOHN RUSSELL CUTLERY CO.,

Green River Works,

MANUFACTURERS OF

Table and Pocket Cutlery,

BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

OLDEST AND LARGEST AMERICAN MANUFACTURERS.

Factories,



Turners Falls, Mass.

F. W. WURSTER,
IRON FOUNDRY
AND AXLE WORKS,
180 to 149 First St.,
Brooklyn, N. Y.

AXLES
SUPERIOR
WAGON, CART AND
CARRIAGE AXLES.
Our facilities enable us to quote the
trade lower prices than any other
manufactory. Send for price list.

J. M. CARPENTER
PAWTUCKET, R.I.

MANUFACTURER OF TAPS AND DIES.

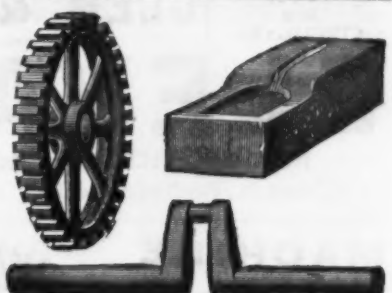
E. A. C. DU PLAINE, ANTI-FRICTION & BABBITT METALS

CHICAGO.

XXX Du Plaine's Patent Nickel Babbitt.
XX Du Plaine's Nickel and Copper Babbitt.
X Du Plaine's Genuine Copper Babbitt.
AA Du Plaine's Genuine Phosphor Babbitt.
A Genuine Babbitt (so called by other makers).
B Lubricating Babbitt.
C Adamantine Babbitt.
No. 1 Hardware Babbitt (very hard).

WRITE BEFORE ORDERING ELSEWHERE.

SOLID STEEL CASTINGS,



FROM CRUCIBLE and OPEN HEARTH.

HYDRAULIC CYLINDERS AND GEARING SPECIALTIES.

CUN METAL ROLLS, PINIONS and CASTINGS.

AIR-FURNACE REFINED MALLEABLE CASTINGS.

All Stock used by us is subject to Chemical Analysis in our own Laboratory.

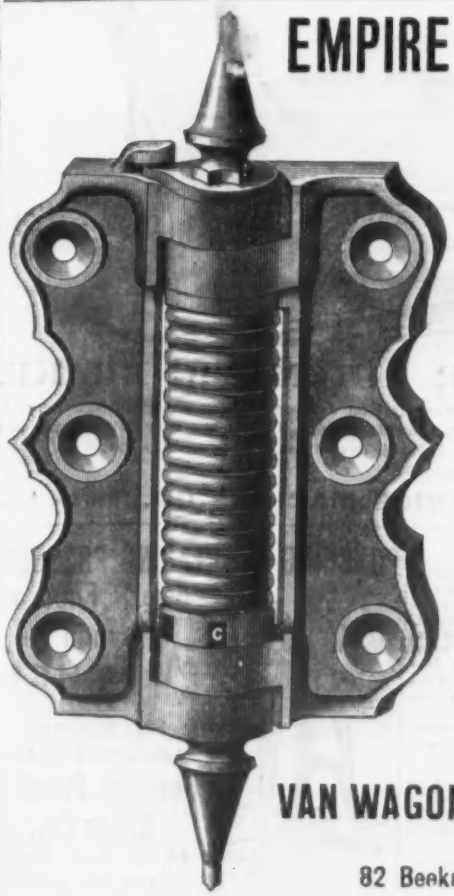
ISAAC C. JOHNSON & CO.,

Established 1853.

SPUYTEN DUYVIL, NEW YORK CITY.

EMPIRE SPRING HINGES,

FOR SCREEN DOORS.



They have larger and stronger springs than any other Screen Spring Hinges in the market.

They are packed ready for use, without the necessity of adjustment, although the tension of the Springs can be readily increased or removed if desired.

3 and 4 Inch,

SINGLE AND DOUBLE ACTING.

MANUFACTURED BY

VAN WAGONER & WILLIAMS CO.,

82 Beekman Street, NEW YORK.